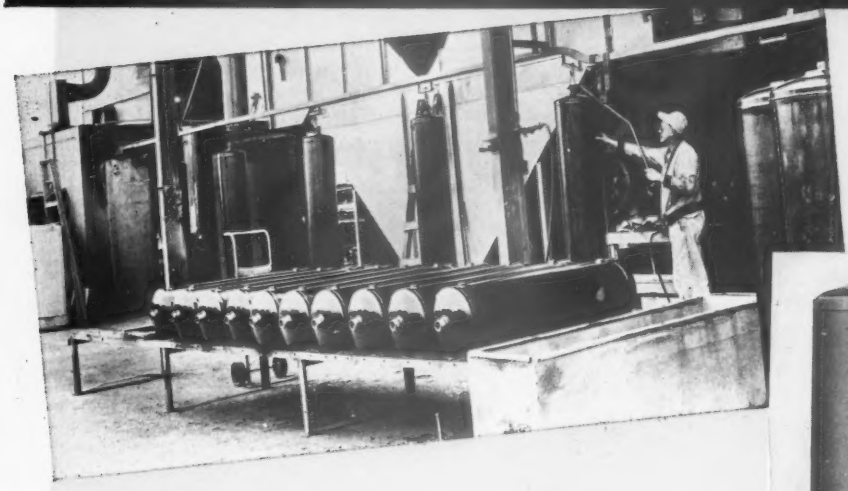
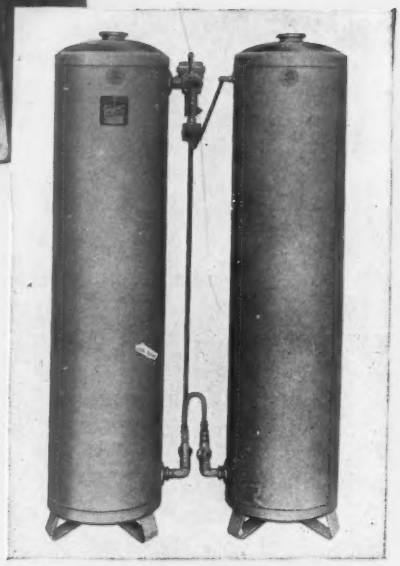
PAINT and VARNISH

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHE

EPON® RESIN does it!





Plastic coating guards water softener tanks against corrosion

HERE'S HOW...

THE ROPER MANUFACTURING CORPORATION of El Monte, California, needed a tough, dependable anti-corrosion lining for tanks used in water treatment. They decided to test a promising coating formulated from Epon 1007 and supplied by the Trail Chemical Company of El Monte.

This Epon resin-based coating, applied to steel panels, easily survived severe tests for metal adhesion and thermal shock. Immersion tests showed that it resisted organic chlorides, detergents, salt spray and acids at both room and elevated temperatures.

Finally, two test panels were taken from an autoclave in which they had been held for two years. The first panel—coated with a high-quality porcelain—showed large rust spots, while the Epon resin-based coating on the other panel *was still intact.* Small wonder that Roper has now standardized on Epon resin-based coatings to line their water softener tanks. More than 30,000 tanks have been delivered, with no complaints to date.

Paint users are rapidly becoming aware of the many advantages offered by Epon resin formulations . . . excellent adhesion, resistance to abrasion and impact, ability to withstand extremes of heat, humidity and the attack of corrosive chemicals. Your Shell Chemical representative will explain how you can take full advantage of Epon resins in your paint and enamel formulations. Write for: "Epon Resins for Surface Coatings" and "Epon Resin Esters for Surface Coatings."

SHELL CHEMICAL CORPORATION

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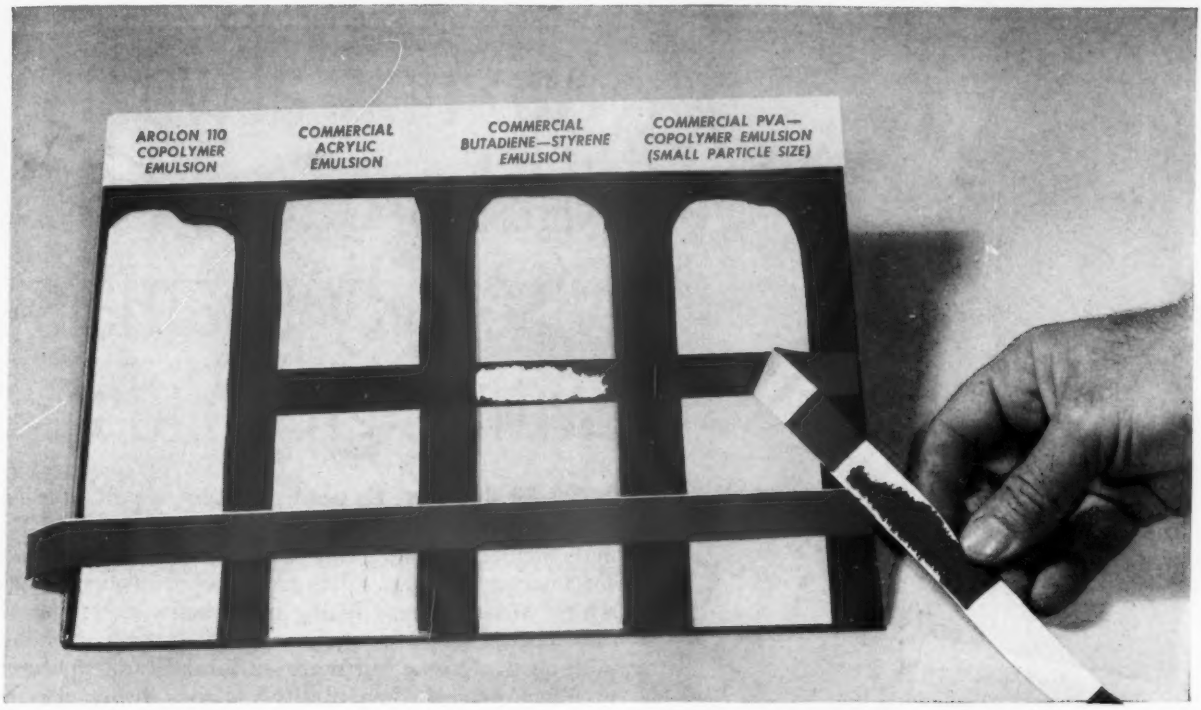
SHELL

New concept in water emulsion vehicles



Tape Test Shows One of Many Exciting Advantages You Can Gain with ADM's Remarkable Arolon 110

Arolon 110 is a new concept in water emulsion paint vehicles. It offers you important advantages over latex paints based on synthetic rubber chemicals.

One of the attractive features inherent in paints formulated with Arolon 110 is *superior adhesion to glossy surfaces.* In the above photo the Arolon 110 paint film (at left) is compared with other latex films. The plastic tape, removed with a sharp pull, stripped off portions of all but the Arolon 110 film.

Prepared by the emulsion polymerization of highly reactive synthetic and oil based monomers, this ADM research development permits formulation of paints which can be washed from brush or roller under a faucet. Yet the dried paint has higher resistance to water than other water emulsion paints. And the same vehicle can be used to make primer-sealer, flat, and semi-gloss paints since Arolon 110's particle size is far smaller than other commercial emulsions.

Other advantages: Easy application even over highly porous surfaces . . . minimum odor . . . absence of settling during storage . . . recoat within an hour . . . outstanding pH stability for long shelf life.

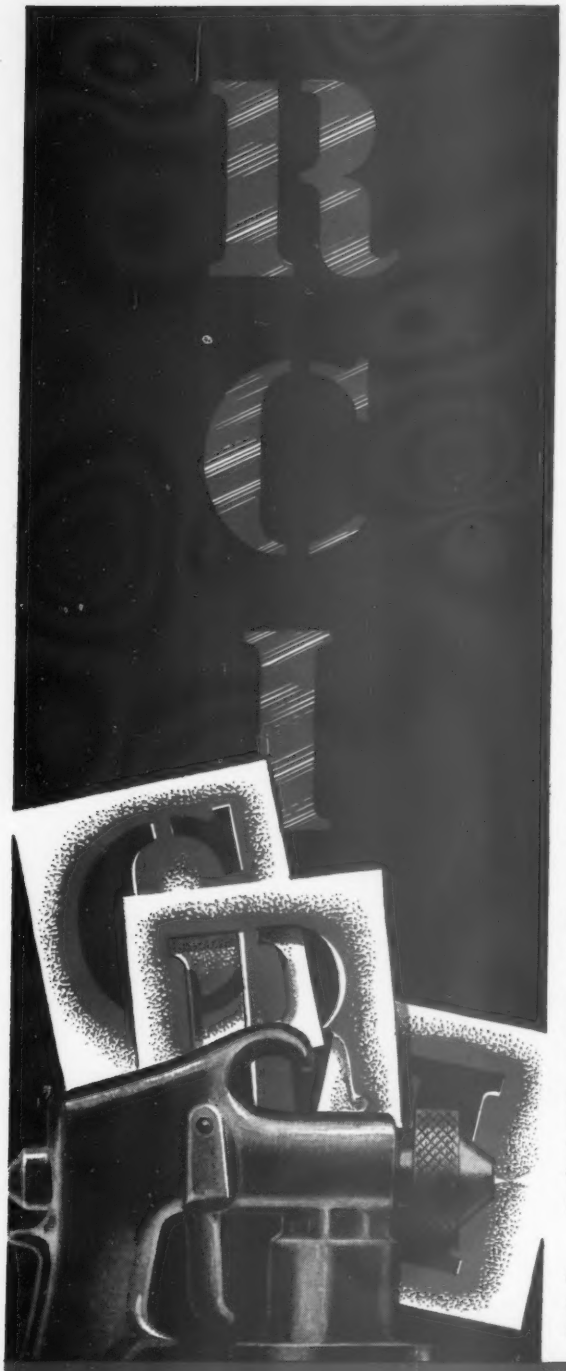
Get full details now. Write for our new bulletin: "Arolon 110—A New Concept in Water Emulsion Paint Vehicles." Address your card, wire, or letter to ADM, 729 Investors Building, Minneapolis 2, Minn.

Paints based on Arolon 110 are easily washed from brushes and rollers with just water from the faucet because of its unique emulsifying system.

Archer-Daniels-Midland

Archer QUALITY

OTHER ADM PRODUCTS: Linseed, Soybean and Marine Oils, Paint Vehicles, Synthetic and Natural Resins, Fatty Acids and Alcohols, Hydrogenated Glycerides, Sperm Oil, Foundry Binders, Industrial Cereals, Vegetable Proteins, Wheat Flour, Dehydrated Alfalfa, Livestock and Poultry Feeds.



Now from RCI:

two new alkyds that produce low viscosity enamels with high solids

P-899-60 BECKOSOL—By combining this new RCI drying oil alkyd resin with a melamine resin you can now formulate automotive and industrial enamels that have both low viscosity and high solids properties . . . using solvents which will not cause lifting or excessive softening of undercoats. P-899-60 BECKOSOL will give your enamels the additional advantages of improved durability on exposure, excellent pigment compatibility and good drying characteristics. You can also use P-899-60 BECKOSOL with medium oil alkyds in the production of air-drying enamels.

P-931-60 BECKOSOL—This *non*-drying oil alkyd resin has also been developed for use with melamine resins such as the new RCI SUPER-BECKAMINES. With P-931-60 BECKOSOL you can formulate low viscosity enamels and lacquers with high solids content *and* high melamine modification. The coatings you develop will exhibit excellent gloss, durability and uniformity of film hardness at varied baking temperatures. When you use P-931-60 BECKOSOL you can also produce a much wider range of colors than is possible with standard alkyd resins for this type of formulating . . . including dark colors and metallics.

Why not experiment with these two new versatile RCI alkyd resins in your own enamel coatings? Write for *free* samples and *Bulletin SC-17* which gives further details on properties and suggested formulations.

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Your Partner in Progress

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PAINT and VARNISH Production

(REG. U.S. PATENT OFFICE)

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 47 JANUARY, 1957 NO. 1

NEXT ISSUE

An interesting article on positive displacement metering for paint and varnish plant systems will be featured in the February issue. Such important topics as meter selection, installation of metering systems, and post-installation procedures will be covered in this article.

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PANAREZ 6-210	11	200-220	165	0-1
PANAREZ 7-210	18+	200-220	150	0-1
PANAREZ 8-210	18+	200-220	130	0-1
PANAREZ 9-210	15	200-220	160	0-1
PANAREZ 12-210	16	200-220	60	0-1

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PAN AMERICAN CHEMICALS

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1957 Looks Bright

IN forecasting the nation's business for 1957, our industrialists, government officials, and economic experts are in general agreement that the present high activity will continue. This prediction is based on the assumption that employment will remain at a high level, and both consumer and capital spending will show a moderate upward trend during 1957.

A joint survey recently issued by the Department of Commerce and the Securities and Exchange Commission estimates that industry will spend at least 8 percent more for new plants and equipment in the first three months of this year as compared with the same period in 1956. In terms of dollars this means that expansion programs will reach an annual rate of 38 billion dollars in the first quarter of this year. Oil companies, steel producers, electric and gas utilities, railroads, and communication companies are among those planning to increase capital expenditures.

In assessing consumer spending during the months ahead, one must consider that in many consumer items supply has caught up with demand. In addition, there has been developing a strong resistance to the high prices of certain commodities, especially appliances. However, a prominent applicance manufacturer, feels that the sale of appliances should continue upward during 1957 reaching a record of close to 15 million units, and estimates that Americans will spend more than 23 billion dollars on major appliances during the next five years. Reasons for this expected upswing in appliance sales are based not only on the general favorable economic conditions, but more on the fact that new types of major appliances such as dryers and dishwashers are creating great consumer acceptance.

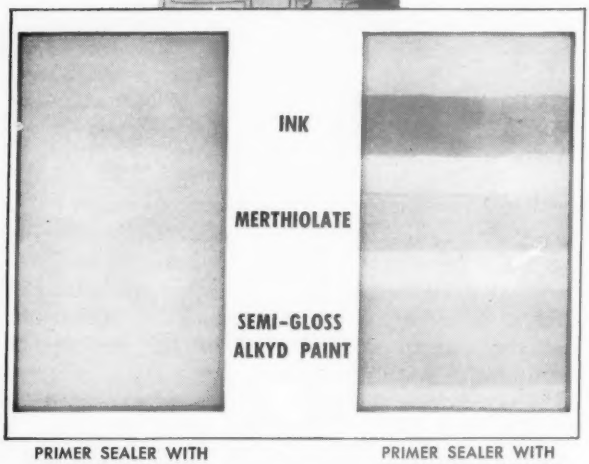
As for the automotive industry, 1957 should realize a production of 6½ million passenger cars, according to the top producers in the field. This would represent roughly a 12 percent increase over 1956, which saw a production of 5,802,247 units. Some are even predicting that 1957 could be the second largest year in the history of automobile production and sales.

The outlook for construction is expected to continue at a high rate during 1957. Outlays for new construction will reach a total of 46½ billion dollars during this year which is about 5 percent above the record volume of more than 44 billion estimated for 1956. Because of the continued tight money policy by the government, residential construction will show only a very slight increase, totalling about 1,125,000 units during 1956. However, the announced plans for increases in industrial, commercial, institutional, public, and highway construction will be a primary factor in this field, which accounts for 16% of our economic activity.

Leading economists are in general agreement that business during 1957 will be excellent and no big downturn is in sight. The Gross National Product is expected to reach an annual rate of $420 billion by the end of 1957, as compared with the $408 billion rate for the third quarter of 1956.

Based on the foregoing predictions, the paint industry can look forward to another year of high activity. However, we must be alert to competitive materials which are being recommended for decorative and protective usage. To combat this trend, research and development plus the search for new and increasing markets are of prime importance in maintaining and increasing the volume of our products. Complacency has no place in the coatings industry.

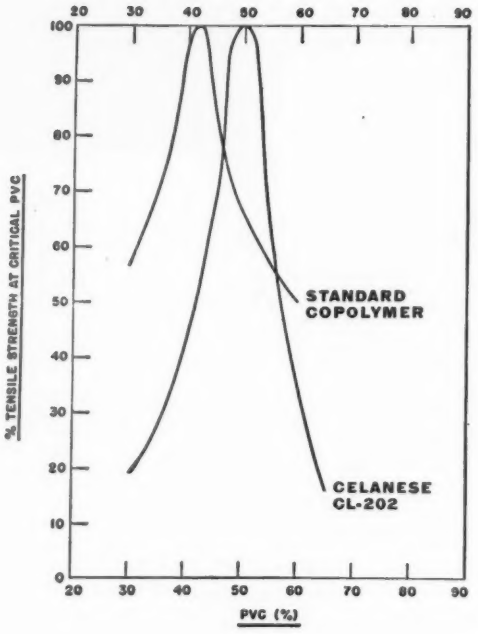
COPOLYMERS



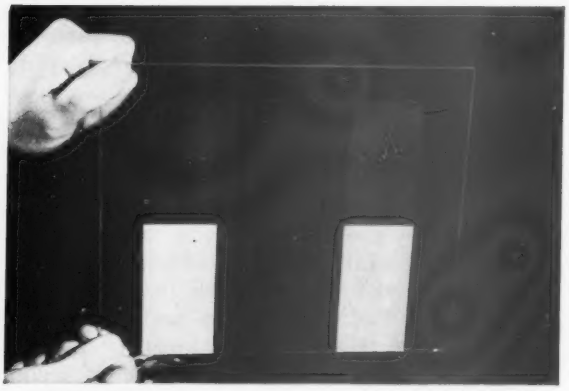
PRIMER SEALER WITH CELANESE EMULSION

PRIMER SEALER WITH STANDARD EMULSION

LOW TEMPERATURE COALESCENCE. Pictured above are two primer sealers identical in formulation except for the emulsions used (both homopolymers). These primers were cast (4 mil wet film) at *34° F. on glass* and allowed to *cure overnight at this temperature*. The paints were then stained and photographed from the reverse side of the glass. The primer on the left made with Celanese PVAc exhibited superior film coalescence as evidenced by the sharp reduction in stain penetration.

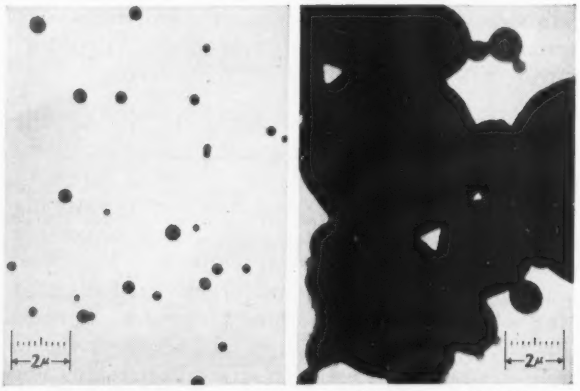


HIGH PIGMENT BINDING. Celanese emulsions are designed as paint vehicles. Because of this they exhibit extremely high pigment binding capacity. The above graph was prepared by plotting the tensile strength of paint films at progressively higher PVC's. A standard formulation was used and only the emulsions differed. In this comparison (both copolymers) the Celanese emulsion exhibited a critical PVC of 8% above the other copolymer.



STANDARD HOMOPOLYMER CELANESE CL-102 STANDARD COPOLYMER

SUPERIOR WATER RESISTANCE. Pictured above are three drawdowns of unpigmented PVAc films. (Both homopolymers plasticized with DBP.) The films were dried 72 hrs., then immersed in water for 5 min. The CL-102 film in the center maintains its crystal clear appearance and is substantially unaffected by the water.



CELANESE EMULSION STANDARD EMULSION

FINE PARTICLE SIZE. The "inside story" of Celanese improved PVAc emulsions is clearly demonstrated in the above photomicrographs. Fine particle size indicates higher pigment binding, better non-settling, tighter, more closely knit films and better penetration of chalky or porous surfaces when applied at low viscosities.

OR HOMOPOLYMERS...

both Celanese PVAc Emulsions can give you highest quality latex paints

With the new Celanse PVAc Emulsions—CL-102 Homopolymer and CL-202 Copolymer—you can formulate paints with quality unsurpassed by any latex paint, regardless of the *type* or *price* of the emulsion used. These are broad claims! . . .

And we can back up these claims because Celanese PVAc emulsions are specifically designed as paint vehicles and represent the latest advances in PVAc emulsion technology . . . advances like these:

Can be formulated at PVC's approaching those of alkyd flats.

Extremely fine particle size.

Superior low-temperature film coalescence—even below 40°F.

Tough, flexible, weather-resistant films.

Superior freeze-thaw stability.

High solids content: 55% ± 1.

Superior pigment wetting ability—extra margin of safety against flocculation difficulties.

Crystal-clear, water-resistant films.

Excellent mechanical stability; can even be milled.

A Celanese technical representative will be happy to discuss these characteristics with you and assist you with any technical problems you have. In addition, Celanese has prepared a manual of standard laboratory tests by which you can determine the properties of any resin emulsion vehicle. You can obtain a copy of this manual along with technical bulletins covering Celanese PVAc paint emulsions by filling out and mailing the coupon below. Celanese®

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EXPORT SALES: Amcel Company, Inc. and Pan Amcel Company, Inc., 180 Madison Ave., New York 16.

Celanese Corporation of America, Plastics Division,
Box 165A 290 Ferry Street, Newark 5, New Jersey

☐ Please send me brochure on Celanese PVAc Emulsions, including test manual.

☐ Please send me samples of Celanese PVAc Homopolymer and Copolymer Emulsions for paints.

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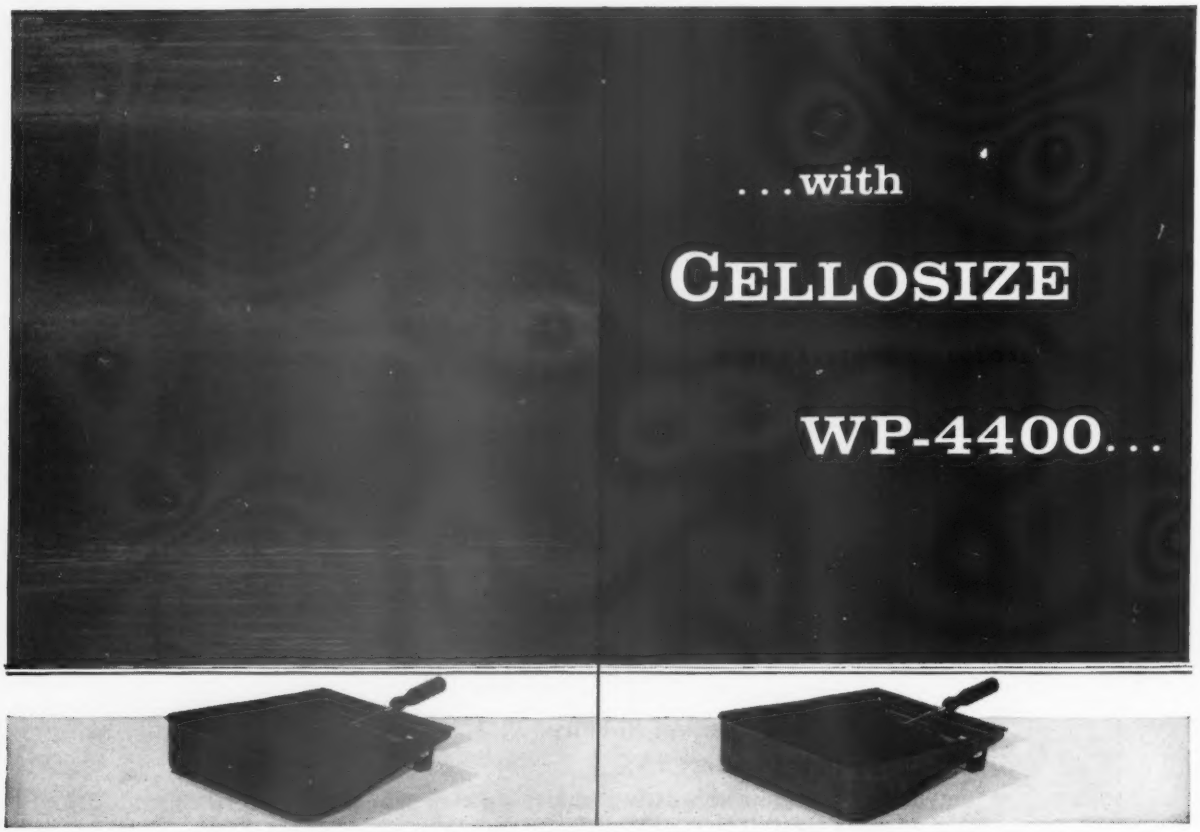
What a difference in latex paints . . .



Nonionic CELLOSIZE WP-4400 gives clean, bright colors with minimum sheen variation.

a new, nonionic, water soluble thickener

Your search for an excellent, nonionic, water soluble thickener for latex paints is over. The answer: CELLOSIZE Hydroxyethyl Cellulose WP-4400, a free-flowing, white powder. Its viscosity in 2% aqueous solution—3500-5000 cps. Look at the added advantages you get with this excellent thickener—

In Production

- *Goes into solution readily at room temperature—this saves you time and money*
- *Stability in presence of dissolved salts is outstanding*
- *Reduces foaming in mixing kettle*
- *Contributes to mechanical, freeze-thaw and viscosity stability*
- *Won't gel at elevated temperatures*

In Application

- *Contributes to better scrub resistance and washability*
- *Improves brushing, leveling, and flow-out*
- *Gives excellent color values, especially with popular deep decorator colors*
- *Reduces sheen variation*
- *Reduces pinholing*
- *Helps improve hiding power*

Now is the time to get your samples and technical data. Write to Carbide and Carbon Chemicals Company, Room 328, Dept. H, 30 E. 42nd Street, New York 17, New York.

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto.

The term "Cellosize" is a registered trademark of UCC

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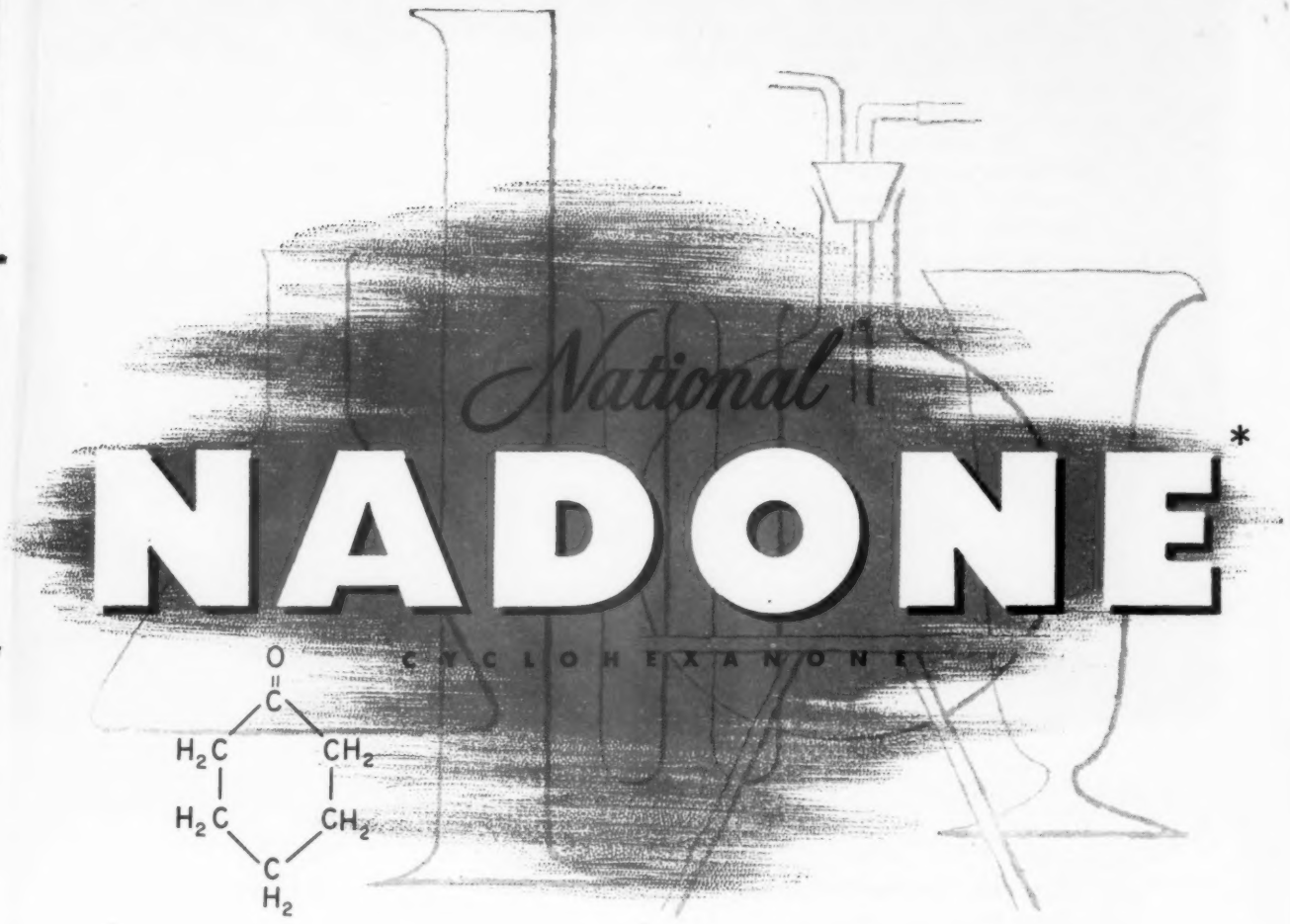

new higher-quality cyclohexanone from a new basic source!

NADONE is the brand name for National Cyclohexanone . . . highest quality volume-production cyclohexanone offered. Minimum purity 99.0%!

National Aniline now gives the resin, plastics, coatings and chemical industries a dependable new source of supply. Production is fully integrated within Allied Chemical and volume is freely available in tank cars or drums from our well-situated plant at Hopewell, Virginia.

Working samples of NADONE are available to show prospective users its exceptional quality.

Bulletin I-19 gives properties, reactions, suggested uses and bibliography. Use the convenient coupon.

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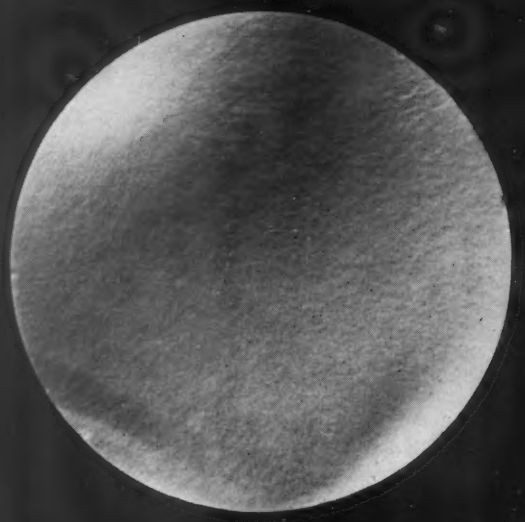
This is an unretouched photo of a heavy section of broken Coors High Density Alumina Ceramic, used for grinding balls and brick. It was formed by the unique Isostatic Process. Obviously, this ceramic is completely homogenous – with no voids or air pockets, and without drying stress lines. This homogenous structure can be found in products formed by the Isostatic Process used by Coors.



FOR MAXIMUM GRINDING RESULTS:

your best buy in grinding balls &

• • • All Coors High Density Grinding Media and Mill Liner Brick are made by the Isostatic Process which produces these thick sections without voids or air pockets and without internal drying stresses. This means that these Coors products are completely homogenous or uniform in physical structure throughout; also, that they have the same hardness (9 on Moh's Scale) at the center as on the surface. Results: Longer service life in your mill; no chipping or cracking of balls to cause gouging or scratching of the lining; uniform hardness which permits media to retain its shape with smooth surfaces for easy cleaning.

With the Isostatic Process, both Coors High Density Grinding Media and Coors High Density Brick are formed initially by pressing a DRY, unfired alumina powder in a rubber mold, under high hydraulic pressure. This uniform pressure from all directions provides uniform compactness and complete homogeneity. Since the powdered ceramic material is dry before it is formed into the shape of grinding media or brick, these products go directly from the forming press to the high temperature (2670°F) continuous kilns—thus eliminating the ordinary drying step, necessary in all conventional wet processes.

Before firing, all ceramic products produced by a wet process must be thoroughly dried, whether they are formed by extruding, casting, hand rolling, etc. Obviously, once a wet process product is formed, the outside dries first. This causes hidden drying stress rings to develop. And finally, the volume occupied by the water is replaced by air—forming hidden voids, as you can plainly see in the fractured piece shown above. Hidden drying stresses cause media to break up in your mill. Voids cause uneven wear of media and brick.

Since Coors High Density Grinding Balls and Mill Lining Brick are dry when they

LZP INDUSTRIAL CERAMICS CO., 275 Kalamath St., Denver 23, Colorado • *National Sales Representatives for:*

This is an unretouched photo of a heavy section of broken high density alumina ceramic. It was formed by a conventional wet process. This ceramic piece illustrates the voids and stress rings caused by differential drying—i.e., drying from the outside in to the center. These inherent imperfections can cause balls to crack, chip and break in the mill, resulting in abnormal wear of the mill lining.

mill liner brick is *Coors* because

are formed, they go directly to the high temperature kilns for firing... thus eliminating all stresses and voids.

Coors also uses all of the conventional wet processes as well as the ordinary dry-press process for the manufacture of many products which are not subjected to the pounding that mill linings and grinding media must take. But Coors uses only the Isostatic Process to make grinding media and liner brick, so they will withstand severe abrasion, impact shocks and other physical stresses.

Made of the same, identical high alumina ceramic which was developed as a grinding ball material... made by the same, identical Isostatic Process... Coors High Density Grinding Media and Mill Liner Brick are companion products. However, because of their uniformity and hardness, Coors Media will give you equally good grinding results, regardless of the lining material used in your mill. Furthermore, the service life of any lining will be longer when the mill is charged with Coors media.

If you want maximum grinding results *plus* maximum service life from your pebble mills, your best buy is Coors High Density Grinding Media and Mill Liner Brick. And when the best costs little, if any more—why settle for less?

COORS PORCELAIN CO.
c/o LZP Industrial Ceramics Co.
275 Kalamath St., Denver 23, Colorado

Please send me technical information and samples of Coors Grinding Media.

Name.....

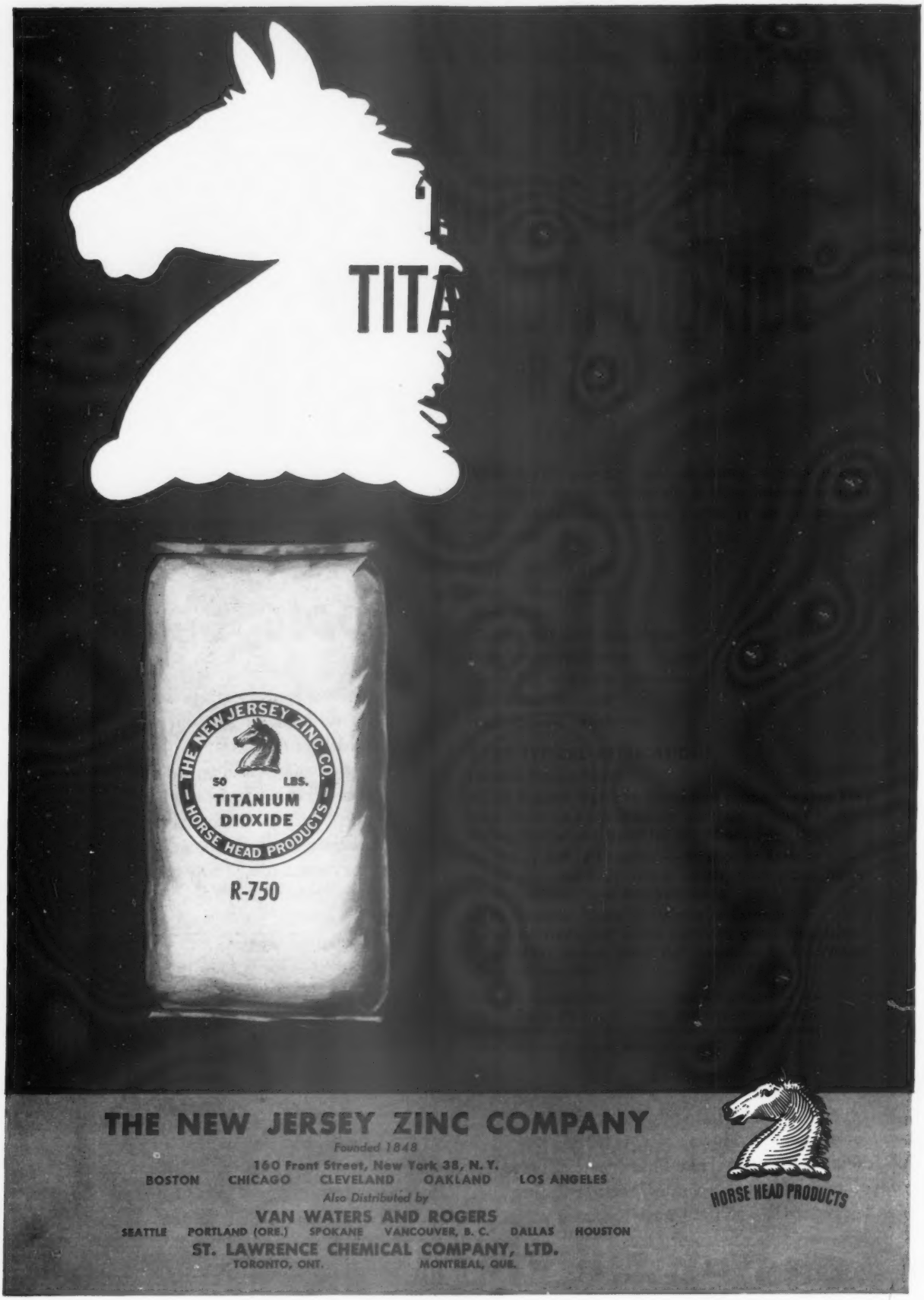
Title.....

Company.....

Address.....

City.....State.....

COORS PORCELAIN COMPANY GOLDEN, COLORADO



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HORSE HEAD PRODUCTS

he used to be a waiter

Always waiting for plaster to cure. He doesn't have to any more. Polyvinyl acetate primers formulated with GELVA emulsions licked this problem. He's a full-time painter again. Because GELVA emulsion primers transmit moisture vapor and resist alkali attack they can be used over green plaster.

Shawinigan has successfully formulated GELVA emulsions for polyvinyl acetate paints since 1944. This unequalled experience combined with continuing research makes Shawinigan a name to remember in today's paint market. For full information write Shawinigan Resins Corporation, Department 2201 Springfield 1, Mass.

GELVA® ***emulsions for paints***

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SPENCER KELLOGG LECITHIN
is identified by the tradename

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Kelecin is a worthy co-product to the many, high quality vegetable oils and oilseed derivatives you know by the Spencer Kellogg trademark and will be welcomed for its quality and uniformity by all users. It is available in six different grades, fluid and plastic, for the convenience of every purchaser.

As experienced technical marketers of our products as well as originators and producers, we also offer you extra benefits resulting from our activity in all phases of application research and technical service.

We invite you to learn about our service and our new product, Kelecin, by writing for the new Technical Service Bulletin, "The use of lecithin in protective coatings". It develops ideas you will not want to miss. Address the Technical Service Department.

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Hydroxyl Content	48.0%
Total Solids	99.6%
Ash, less than	0.01%
Equiv. Comb. Wt.	35.41

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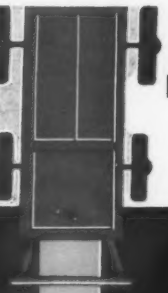
926 Market St., Wilmington 99, Delaware

ask your Velsicol Representative...



How to make traffic paint tougher

Rugged traffic paints that withstand constant heavy wear are one of the many coating vehicles made better at lower cost with Velsicol Hydrocarbon Resins. Among the improved physical characteristics that Velsicol Resins make possible are greater hardness, adherence, and resistance to impact. Technical Bulletin 203 tells why, and your Velsicol representative can show you how. Get them both in front of you soon!

Velsicol Hydrocarbon Resins for Coating Vehicles • soluble in aliphatic and aromatic naphthas • compatible with styrene copolymer, chlorinated rubber resins, and marine and vegetable oils • fast drying • durable • available in solids or solutions.

In Aluminum vehicles provide high lustre • good leafing • long leaf retention.

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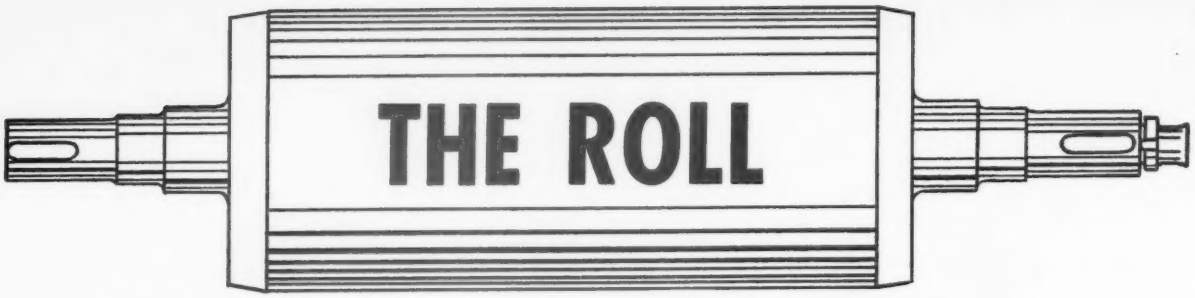

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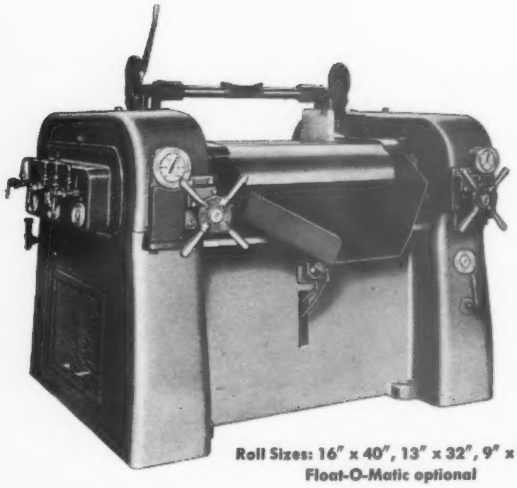

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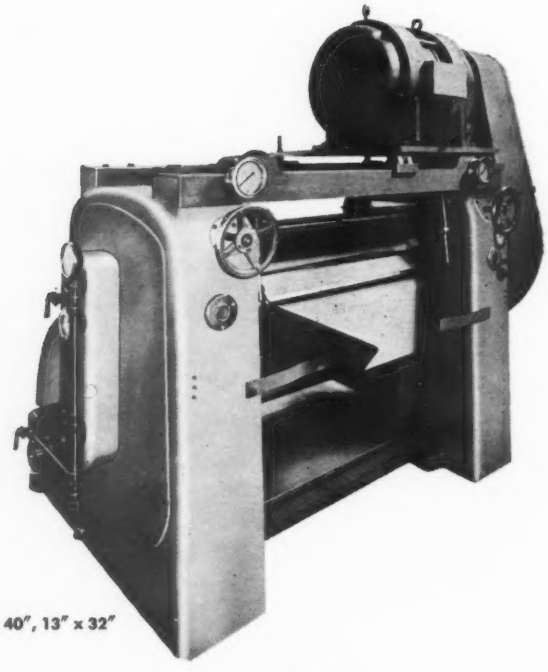

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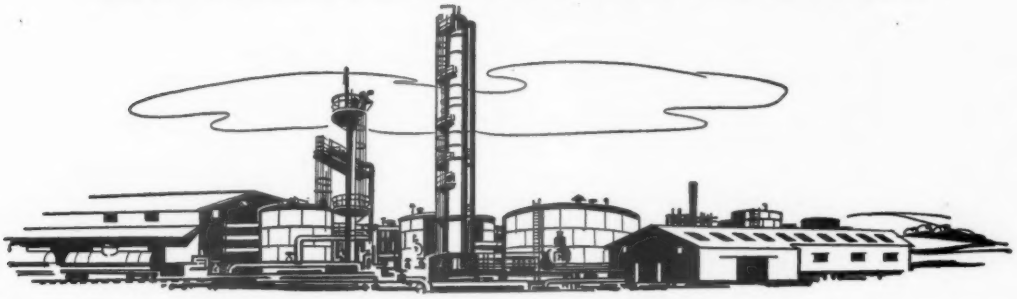

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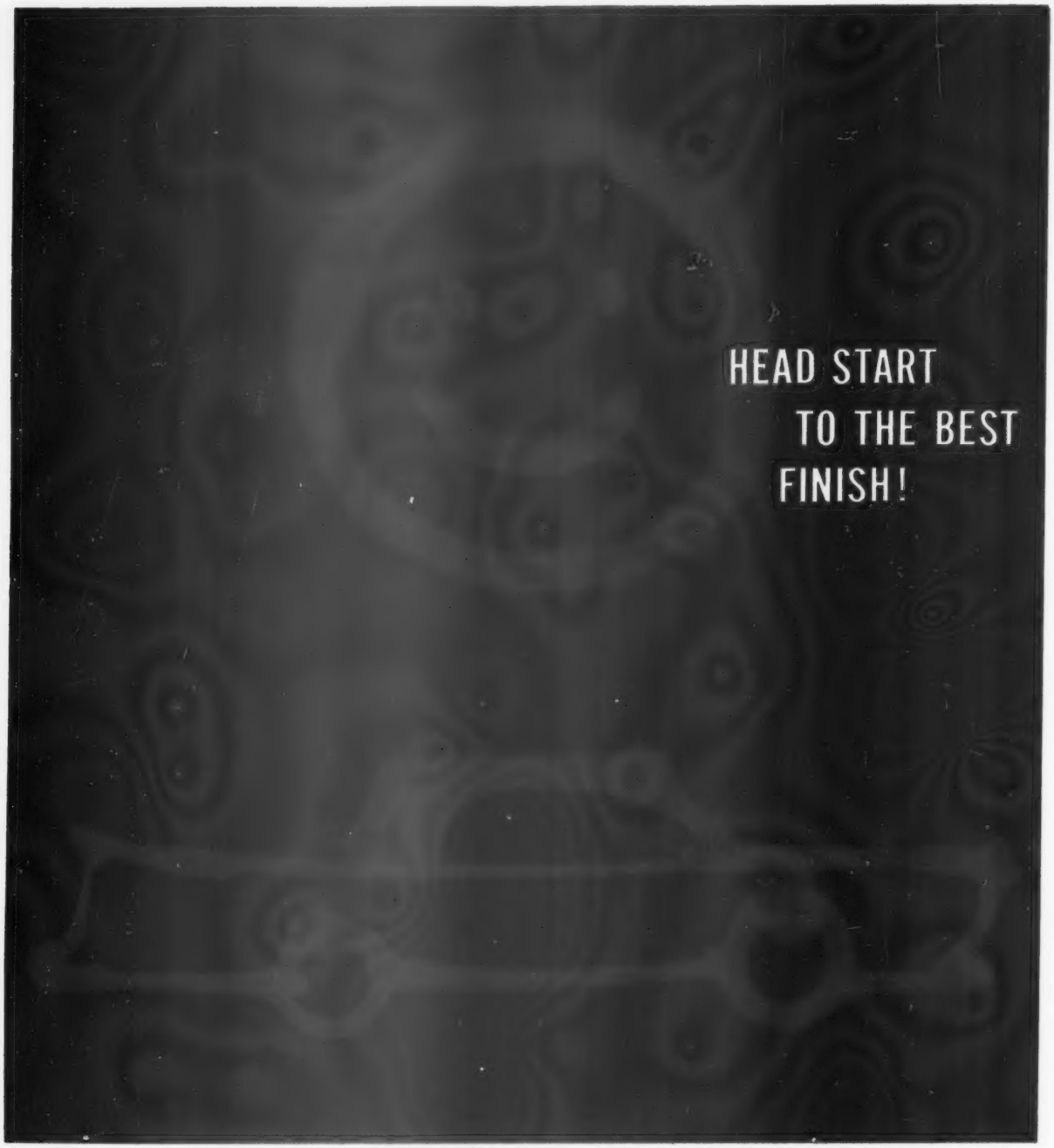

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LIQUID POLYBUTADIENE in SURFACE COATINGS

J. A. Shotton

By
J. A. Shotton*
and
C. W. Wolfe*

C. W. Wolfe

This report characterizes the general properties of "Butarez" and outlines the areas of potential application for "Butarez" within the protective coatings field. Specific coatings formulations and detailed evaluation data are presented. This information was obtained from published Phillips literature as well as recently developed laboratory data.

This article has been prepared exclusively for "Paint and Varnish Production."

IN recent years, the development of synthetic materials to replace and compliment natural resins in the protective coatings field has progressed at a breathtaking pace. This highly competitive race has resulted in the availability of a host of synthetic materials which can be used to prepare tailor-made coatings possessing properties unattainable using the raw materials of the past.

The recent development of reactive liquid hydrocarbon oils as potential raw materials for new and improved coating formulations has aroused much interest within the protective coatings industry. It is apparent that the development of a synthetic drying oil with general properties superior to those of conventional oils and the price of which is obviously independent of the vagaries of agricultural production will be of vital interest to the coatings trade. "Butarez" liquid polybutadiene is such a material.

Physical Properties

"Butarez" is a reactive liquid homopolymer of butadiene possessing a pronounced unsaturation which readily permits further polymerization or chemical modification. The manufacturing process, the chemical structure of the polymer and some of its reactions and chemical properties have been described by Crouch and Shotton (1). The product is stable at ordinary temperatures thus permitting shipment, storage, and handling in a normal manner. Typical properties characterizing this material are listed in Table I. It is interesting to note the degree of unsaturation in this liquid polybutadiene as indicated by the high iodine number. Analytical determinations indicate that the polymer contains about 0.8 double bonds per C-4 unit.

This liquid resin is soluble in aromatic, aliphatic, and chlorinated hydrocarbons thus permitting the use of conventional formulation techniques. It is insoluble in water and exhibits only limited solubility in acetone, the lower alcohols and in "Carbitol" and "Cellosolve".

The unsaturation and general reactivity of "Butarez" suggest many potential applications in the protective coatings field. Extensive formulation and application research has indicated the following general areas of potential application for this resin.

Color, Gardner	10
Molecular Weight, Approximate	1500
Viscosity, Centipoises, 100 F	2500
Specific Gravity	0.91
Specific Gravity D240	0.91
Iodine Number, Approximate	365
Volatile Material, Weight Per Cent*	1.0
Ash, Weight Per Cent	0.05

*Sample is heated at 300 F for 15 minutes at an absolute pressure of 10 mm of mercury. The loss in weight is recorded as the per cent of volatile material.

Table I. Typical properties of "Butarez" liquid polybutadiene.

*Phillips Petroleum Co., Bartlesville, Oklahoma.

(1) W. W. Crouch and J. A. Shotton, Industrial and Engineering Chemistry, Vol. 47, Page 2091, October 1955.

Applications

A. Thermally-Cured Spirit Varnishes

This liquid polybutadiene resin can be reduced with a suitable solvent such as mineral spirits, applied using conventional techniques, and baked at elevated temperature to yield tough, flexible films possessing excellent adhesion and a high degree of chemical resistance.

The color, hardness, flexibility, and general chemical resistance of thermally cured films of this resin are functions of the baking conditions employed. In general, the color, hardness, and chemical resistance of such films increase while the flexibility decreases as the time and/or temperature of cure are increased. Laboratory studies indicate that an optimum balance of film properties can be obtained by baking at temperatures in the range of 375 to 425 F for 5 to 15 minutes.

A study of infrared spectra indicates that the mechanism of the thermal cure of "Butarez" film involves both cross-linking through the vinyl side chains or internal double bonds and the formation of carbon-oxygen linkages normally associated with air-dried films. When this resin is cured in a larger mass such as a casting, the cure, except on the surface, is entirely one of cross-linking. The internal double bonds have been found to be more reactive than the vinyl side chains. The improved chemical resistance of the baked "Butarez" film is apparently due to the lack of ester linkages as found in conventional drying oils.

The effect of representative organic solvents on this liquid polybutadiene films applied to electrolytic tinplate at a film weight of 6.0 mg/sq. in. and cured for 15 minutes at 400 F is shown in Table II.

In general, aside from excellent resistance to organic solvents, properly baked films of this resin exhibit a marked degree of resistance when exposed to dilute solutions of a variety of inorganic acids, bases, and salts. Such coatings are relatively unaffected by prolonged immersion in ten per cent solutions of hydrochloric acid, nitric acid, ammonium sulfate, ammonium nitrate, and a five per cent solution of sodium hydroxide. In contrast, a ten

Chemical Agent	Time to Failure
Glacial Acetic Acid	1 hour
Methylamine (25% solution)	10 days
Propionaldehyde (vapor phase)	16 days
Cyclohexylamine	30 days
Morpholine	4 months
Tetrahydrofurfuryl Alcohol	4 months
Carbitol	Film intact after 6 months
Cellosolve	" " " " "
Ethyl Formate	" " " " "
Methylcyclohexanol	" " " " "
Pyridine	" " " " "
Aniline	" " " " "
Dioxane	" " " " "
Chlorobenzene	" " " " "
Carbon Disulfide	" " " " "
Ethylene Chloride	" " " " "
Dodecyl Mercaptan	" " " " "
Ethyl Alcohol	Film intact after 1 year
Benzyl Ether	" " " " "
Chloroform	" " " " "
Methylisobutyl Ketone	" " " " "
Isoamyl Acetate	" " " " "
Isoctane	" " " " "
Toluene	" " " " "

Table II. General chemical resistance of baked "Butarez" coatings.

Processing Time in Min., Steam at 15 psig		Butarez	"Butarez" + 2 Per Cent ZnO	"Butarez" + 3 Per Cent ZnO	"Butarez" + 4 Per Cent ZnO	Commercial Enamel R	Commercial Enamel C
0	Pencil Hardness[a]	6	6	6	6	4	4
	Adhesion[b]	100	100	100	100	100	100
60	Pencil Hardness	5	6	6	6	2	3
	Sulfide Staining[c]	1	0	0	0	1	0
	Adhesion	100	100	100	100	10	100
90	Pencil Hardness	4	6	6	6	2	3
	Sulfide Staining	1	2	0	0	2	1
	Adhesion	100	98	100	100	0	95
120	Pencil Hardness	4	5	5	6	1	3
	Sulfide Staining	3	3	2	1	4	2
	Adhesion	5	100	100	100	0	95
150	Pencil Hardness	4	4	4	5	—	—
	Sulfide Staining	4	4	4	1	—	—
	Adhesion	5	20	20	100	—	—
165	Pencil Hardness	—	—	5	5	—	—
	Sulfide Staining	—	4	4	1	—	—
	Adhesion	—	10	50	100	—	—

[a]Hardness number of drawing pencil required to scratch dried film.
[b]Percentage of film not removed by pressing on and removing Scotch tape.
[c]Arbitrary rating—0 = no stain; 4 = very severe staining.

These tests were carried out on tinplate coupons using Butarez films baked on for 10 minutes at 400 F at a film weight of 7.5 mg/sq. in. Commercial can enamels were included as controls. Under the conditions of the test all of the Butarez formulations were superior to the R enamel and those containing three to four per cent zinc oxide were equal to or superior to the C enamel.

Table III. Dog food processing tests.

	Tack Free	Rub Dry	Hard Dry	Sward Hardness, Days 1	7	15
		No Driers				
"Butarez" Liquid Polybutadiene	46-38 hr.	2.5 days	4-5 days	..	12	32
Raw Linseed	5 days	7 days	....	Still soft after 14 days		
Raw Tung	4 days	6 days	....	Wrinkled		
Safflower 22	3 days	4 days	....	..	4	..
	Driers, Per Cent—0.03 Co, 0.03 Mn, 0.15 Pb					
"Butarez" Liquid Polybutadiene	2 hr.	6 hr.	8 hr.	..	20	26
Raw Linseed	36 hr.	48 hr.	....	Still soft after 14 days		
Raw Tung	24 hr.	36 hr.	....	Wrinkled		
Safflower 22	24 hr.	36 hr.	....	..	8	..

Table IV. Drying rates and hardness.

Drier Level Wt. Per Cent			Drying Times Hours			Sward Hardness			
Co	Mn	Pb	Set	Rub Dry	Hard Dry	1 Day	7 Days	15 Days	30 Days
0	0	0	24	60	—	—	8	22	30
0.02	—	—	—	14	24	4	20	32	—
—	0.02	—	—	14	24	4	22	34	37
—	—	0.10	24	—	—	—	14	14	40
0.02	0.02	0.10	—	—	14	12	24	33	41
0.04	—	—	—	—	14	10	14	23	29
—	0.04	—	7	11	14	6	14	27	38
—	—	0.20	24	—	—	—	10	32	34
0.04	0.04	0.20	2	6	8	12	20	26	44
0.03	0.03	0.15	2	6	8	10	20	26	—
0.06	0.06	0.60	24	60	120	0	10	28	36

Table V. Effect of driers in air-dried "Butarez" liquid polybutadiene coatings.

Linseed Oil	Soybean Oil	"Butarez"	Bodying Time, Hrs. at 575 F to Z-2 Vis	Gardner Color	Acid No.
—	90	10	5	7	18.8
—	85	15	3½	7	14.9
—	75	25	1½	7	5.2
100	—	—	4¼	4	15.7
85	—	15	2	6+	6.8
75	—	25	½ to 1	6+	3.8

Table VI. Heat bodying of mixtures of oils and "Butarez" liquid polybutadiene.

Formulation	Specific Permeability, Mg. H_2O/Sq. Cm./Mm. Hg/ 24 Hr. at 100° F.
"Butarez" Liquid Polybutadiene	3.9
"Butarez" Liquid Polybutadiene-Linseed Oil	1.4
Commercial Phenolic Varnish	8.1
Commercial Oleoresinous Varnish	9.1

Table VII. Moisture vapor transmission.

per cent solution of sodium chloride will destroy the adhesion of these films in a relatively short time.

Detailed viscosity studies indicate that the Gardner viscosity of "Butarez" ranges from Z-5 to Z-6 for 100 per cent, down to A-1 for a 50/50 solution in mineral spirits. The viscosity of 100 per cent "Butarez" drops from about 1400 centipoise at 140 F to 310 centipoise at 200 F. Solution viscosities decline in a similar manner as the temperature is raised.

The general flexibility and chemical resistance of baked "Butarez" films suggest the use of this liquid polybutadiene as a can coating resin. The absence of the ester-type linkages present in conventional oleoresinous coatings materially improves the resistance of baked films of this resin to attack by the animal and vegetable fats and oils normally encountered in food processing.

Data on the stability of these coatings exposed to dog food processing tests are presented in Table III.

B. Air-Dried Spirit Varnishes

When this liquid polybutadiene per se is applied in a thin coat, it will slowly polymerize to a hard film. The rate of drying is faster than that of conventional drying oils such as tung or linseed. The addition of metallic driers greatly accelerates the drying rate. Table IV presents a comparison of drying rates of 3 mil wet films of "Butarez" and some of the conventional drying oils.

This polybutadiene resin can be reduced with a solvent such as mineral spirits, conventional naphthenate driers incorporated, and used as an air-dried coating. Table V lists the effect of metal naphthenate driers in air-dried "Butarez" coatings.

Two coats of a varnish consisting of "Butarez", solvent and drier system, applied to wood produce a tough hard finish that possesses high gloss coupled with sufficient flexibility to receive hammer blows without excessive cracking or blushing. This type of formulation has been applied to oak, mohogany, birch, pine and magnolia panels and subjected to indoor exposure for more than two years without apparent loss of gloss, checking or yellowing. Exterior exposure tests

Product	Identity	Solution	Film
Arochlor 5460	Chlorinated Biphenyl	C	C
Ester Gum C	Ester Gum C	C	C
Parlon 20	Chlorinated Rubber	I	I
Piccolyte S-25	Terpene Resin	C	C
Velsicol AG-11-2	Hydrocarbon Polymer	C	C
Epon 1001	Epoxy Resin	I	I
Melmac 245-8	Melamine Resin	I	I
Amberol St-137X	Non-Heat Reactive Phenolic	C	C
Arofene 775	Non-Heat Reactive Phenolic	I	I
Arochem 90	Modified Phenolic	I	I
Syntex 128	Alkyd, 42% Soy Oil	C	C
Aroplaz 1306M75	Resin Modified Alkyd, 66% Drying Oil	C	C
Beckosol 1307 EL	Alkyd, 41% Drying Oil, 41% Phthalic	I	I
Syntex 62	Alkyd, 56% Soy Oil, 31% Phthalic	I	I

* This study was conducted using 50 weight per cent solutions of the "Butarez"-resin mixture in toluene or toluene-butanol solvent. Three mil wet films were baked at 300 F-400 F until dry to touch. C or I designates compatibility or incompatibility over all ratios of mixture.

Table VIII. Compatibility of "Butarez" with some selected commercial resins.

of pine and redwood panels coated with this formulation indicate that such a coating is equal to or better than conventional long oil varnishes. More extensive formulation work in this area of application may yield superior furniture or exterior finishes.

C. In Drying Oils and Alkyd Resins

"Butarez" will readily polymerize with drying and semi-drying oils to produce light colored products exhibiting improved drying and bodying characteristics. The pronounced effect of adding this material to such oils is presented in Table VI. It is also interesting to note the low moisture vapor transmission of films prepared from "Butarez" compared to conventional varnishes as shown in Table VII.

In order to facilitate formulation of "Butarez", detailed compatibility studies have been undertaken. The unique characteristics of this liquid polybutadiene make it virtually impossible to predict its compatibility with given commercial resins without actually testing the proposed mixture. A brief listing of compatible and incompatible "Butarez"-resin mixtures is presented in Table VII. Many resins not listed show limited compatibility.

D. Specialty Applications

In view of the excellent high temperature properties of baked "Butarez" films, considerable interest has developed in this material for possible utilization in medium temperature and high temperature protective coatings applications. A metallic pigmented formulation such as that listed in Table IX will withstand temperatures in the range of 400-600 F for extended periods without degradation.

"Butarez" Liquid Polybutadiene	100
Aluminum Powder	100
Mineral Spirits	135
Naphthenate Driers, Wt. Per Cent Based on Butarez	
Cobalt	0.03
Manganese	0.03
Lead	0.30

Table IX. Heat resistant formulation.

Test panels coated with such a formulation have been exposed to temperatures in excess of 1200 F for as long as 30 seconds without visible decomposition. The excellent thermal stability and chemical resistance of liquid polybutadiene-based coatings suggest their use in a wide variety of industrial applications including smoke stacks, flues, reaction vessels, ovens, transfer lines, rocket cases, etc.

"Butarez" has been utilized in pigmented coatings for extended periods of time under severe conditions in various pilot plant and laboratory applications. The interior of a laboratory oven coated with the above formulation is in excellent condition after 20 months service in the 400-600 F temperature range. Proper surface preparation is of the utmost importance in extending the service life of this type of coating. Preliminary evaluations of this nature indicate that there is definite promise for the utilization of this resin in formulations designed to function in the 300-600 F temperature range.

E. Chemical Modification

The unsaturation of liquid polybutadiene adapts it to numerous chemical reactions which yield products that may be of interest to the protective coatings industry. "Butarez" can be readily chlorinated, hydrogenated, hydroxylated, epoxidized, vulcanized, and reacted with maleic anhydride. Although the reaction products of the above processes have not yet been fully investigated for protective coatings applications, it is possible that using these techniques, this resin can be converted into a material which may be used to produce new and greatly improved protective coatings.

Summary

In summary, the experimental evaluations conducted by *Phillips Petroleum Company* and numerous evaluators in the coatings trade suggest the utilization of "Butarez" liquid polybutadiene as a base resin for baked protective coatings in which superior chemical resistance and thermal stability are required, as a base resin for air-dried spirit varnishes in which improved adhesion and gloss are desired, as a modifying agent for drying oils and alkyd resins to reduce over-all bodying and drying time, and as a vehicle in heat-resistant coatings for both outside and inside maintenance paints. Application research is being intensified to effect the development of this resin as a new and valuable tool to aid in solving the surface protection problems of industry. The successful development of this potentially low-priced synthetic drying oil will undoubtedly have a far reaching effect in the coatings field.

Butarez liquid polybutadiene is currently available in limited commercial quantities from Phillips Petroleum Company. Samples and additional technical information are available upon request to the Market Development Division, Phillips Petroleum Company, Bartlesville, Oklahoma.

Butarez is a trademark of the Phillips Petroleum Company.

UPGRADING DRYING OILS with CHLORINATED RUBBER

Study shows how chlorinated rubber can be dissolved in drying oils and the resulting solution thinned with mineral spirits to form useful vehicle systems*

THE properties and uses of chlorinated rubber are, in general, well known by the coatings industry. As a modifier for oleoresinous vehicles, it results in coatings with faster dry, greater toughness, and good chemical resistance. In combination with nonreactive resins and plasticizers, it forms coatings which will resist strong corrosive environments.

One of the lesser known properties of chlorinated rubber is the fact that it can be dissolved in drying or semi-drying oils. These oils include linseed, fish, tung, soybean, and dehydrated castor oil. One method of dissolving chlorinated rubber is to heat it and the oil together for about one hour at 110-120° C. The resulting clear, viscous solution can be thinned with substantial amounts of mineral spirits to form useful vehicle systems.

Properties

Chlorinated rubber-oil vehicle systems are now being evaluated. Some of the advantages to be gained from these unique vehicles are:

1. *Decreased dry time*—roughly half to one-third that of coatings based on unmodified oil vehicles; equivalent to that of coatings based on alkyd or varnish vehicles.
2. *Superior chemical resistance.* It is an established fact that chlorinated rubber upgrades the chemical resistance of alkyd and varnish films, against outside sources of corrosive media, as well as alkaline chemicals produced internally when metals ultimately corrode. Chlorinated rubber can do the same for drying-oil films.
3. *Low odor, low cost,* nonlifting solvents can be employed.
4. *Good metal-wetting properties.* The wetting properties of oils are decreased when they are cooked or polymerized in varnishes and alkyds. Unpolymerized oils in chlorinated rubber-oil systems should retain their good wetting properties.

Solubility

The solubility characteristics of chlorinated rubber in oil are presented in Table I.

Oils	Saponification Number	Iodine Number	Acid Number	Gardner-Holt Viscosity
Raw linseed	185 - 195	170 - 190	4 max.	A1 - A
Alkali-refined fish	190 - 193	180 - 187	0.5 max.	A
Alkali-refined soybean	190 min.	130 min.	0.3 max.	A
Raw tung	190 - 195	163 min.	8 max.	I - J
Dehydrated castor	--	135 - 138	3.0	G - H

Table I. Important characteristics of drying oils used in this study.

The curves in Figures 1 to 5 illustrate the maximum concentrations of various chlorinated rubber types which can be dissolved in oils by heating to 110-120°C. The maximum was arbitrarily selected as the chlorinated rubber concentration which would result in 100% solids vehicles with a viscosity of 1000 poises (1 poise = 100 cps.) at 75° F.

The ternary diagrams in Figures 6 to 10 illustrate the substantial amount of mineral spirits that the chlorinated rubber-oil solutions will tolerate.

Table II is a concise summary of the information in Figures 1 to 10. It can be seen from Table II that linseed oil has the greatest solvent power for chlorinated rubber. The solvent power of the other oils (in decreasing order) can be rated as follows: fish, soybean, DCO, and tung.

*Based on report issued by the Hercules Powder Co., Wilmington, Del. Parlon (chlorinated rubber) is a registered tradename of the Hercules Powder Co.

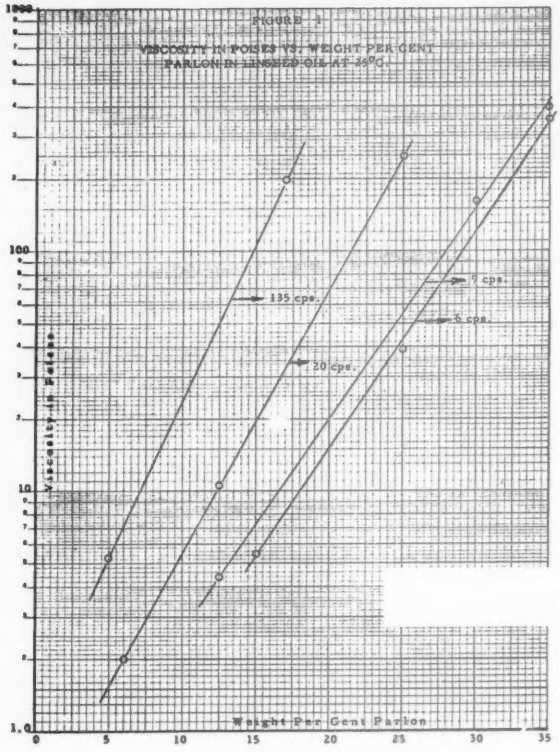


Figure 1. Viscosity in poises vs. weight percent Parlon (chlorinated rubber) in linseed oil at 25 C.

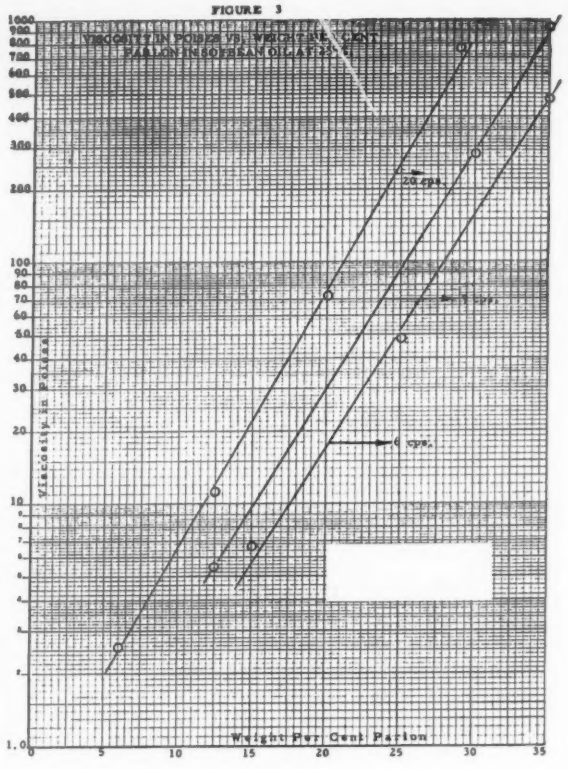


Figure 3. Viscosity in poises vs. weight percent Parlon (chlorinated rubber) in soybean oil at 25 C.

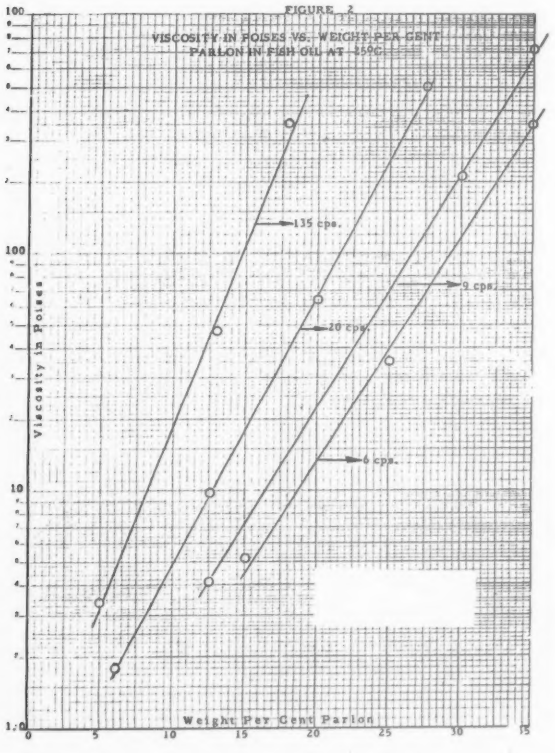


Figure 2. Viscosity in poises vs. weight percent Parlon (chlorinated rubber) in fish oil at 25 C.

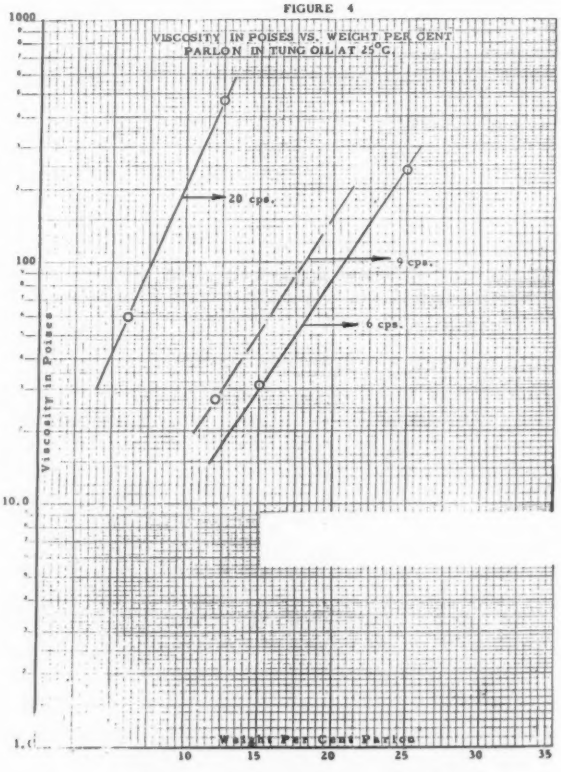


Figure 4. Viscosity in poises vs. weight percent Parlon (chlorinated rubber) in tung oil at 25 C.

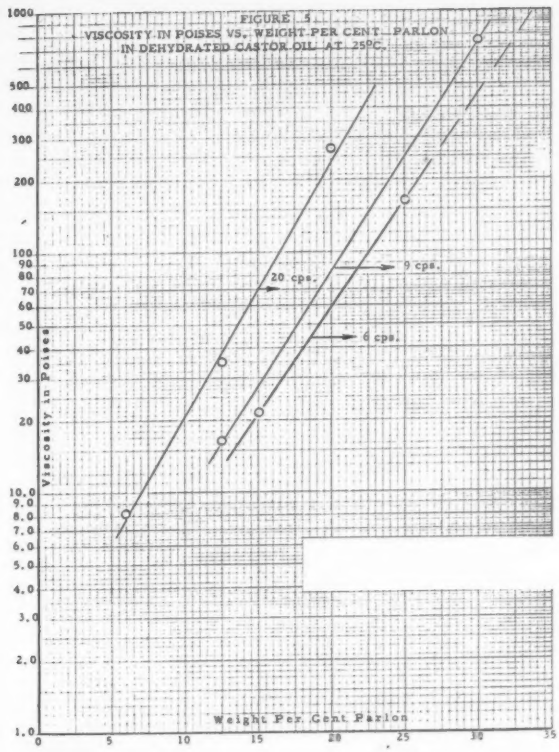


Figure 5. Viscosity in poises vs. weight percent Parlon (chlorinated rubber) in DCO at 25 C.

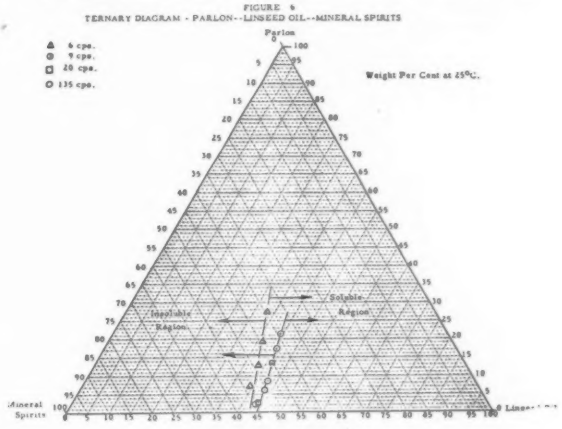
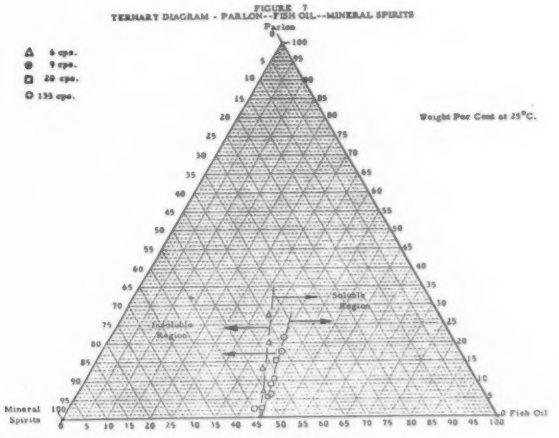


Figure 6 (above)
Figure 7 (below)



Maximum Concentration of Parlon* That Can Be Dissolved in Oil at 110 - 120°C. to Produce a Workable Viscosity** Vehicle for Thinning While Hot With Mineral Spirits

Viscosity Parlon	Type Oil				
	Linseed	Fish Oil	Soybean	Tung***	DCO
5	40	40	38	31.5	33.5
10	39	37	35.5	26.5	31.5
20	30.5	30.5	30.5	12.5	26
125	22.5	21.5	--	--	--
Approximate amount of mineral spirits permitted in vehicle at maximum Parlon concentration	40	40	40	50	--

* Some variation between Parlon lots can be expected
** Arbitrarily selected as 1,000 poises at room temperature.
*** Low values probably caused by rapid polymerization of tung oil; inert atmosphere might help.

Note: Tolerance (based on total vehicle) increases rapidly with reduction in Parlon content.

Table II

Dissolving Methods

The quickest way to dissolve chlorinated rubber in oil is to combine the ingredients and heat them to 110-120° C. for about one hour, with moderate agitation.

Some preliminary laboratory experiments have also shown that up to about 40% chlorinated rubber of the 10 cp. type can be dissolved in linseed oil without external heat by using a high-speed, high-shear laboratory agitator. The temperature of the chlorinated rubber-oil solutions reached about 60° C. because of the high-shear rate. Clear solutions were obtained in about 4 to 20 hours, depending on the speed and the type of stirrer. Large, high-speed, high-shear dissolvers are available which might be useful for preparing chlorinated rubber-oil solutions on a plant scale.

It was also possible, on a laboratory scale, to dissolve 20% chlorinated rubber of the 5 cp. type in linseed oil by ball-milling for 48 to 72 hours. Higher viscosity types or higher concentrations of chlorinated rubber became too viscous to be dissolved in a ball mill.

Attempts, based on ball mill and laboratory agitator tests, to dissolve chlorinated rubber in linseed oil previously thinned with substantial quantities of mineral spirits were unsuccessful.

In thinning chlorinated rubber-oil solutions, it is advantageous to partially thin chlorinated rubber-oil solutions while they are still warm and less viscous. The mineral spirits or other aliphatic thinner should be added slowly, with agitation, to allow any precipitated chlorinated rubber to redissolve.

However, *final thinning* should be carried out at *room temperature.* Chlorinated rubber-oil solutions have less tolerance for mineral spirits as the temperature is increased, and severe precipitation could occur if too much thinner is added at elevated temperatures.

Viscosity Considerations

In order to have an intelligent basis for formulating chlorinated rubber-oil vehicles and coatings, it is necessary to know the minimum viscosity which can be obtained by thinning them. Pigments increase the viscosity of vehicles. Therefore, it may be necessary to prepare clear chlorinated rubber-oil vehicles with a

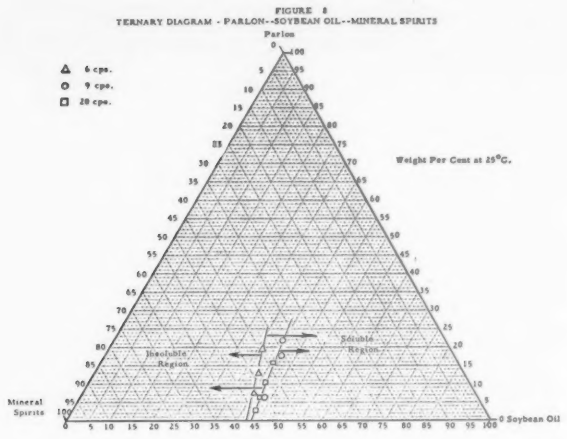


Figure 8

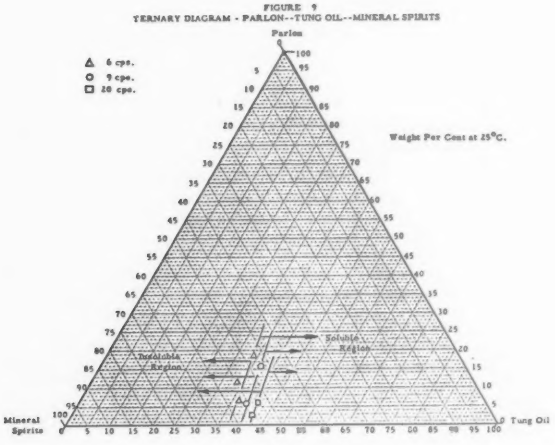


Figure 9

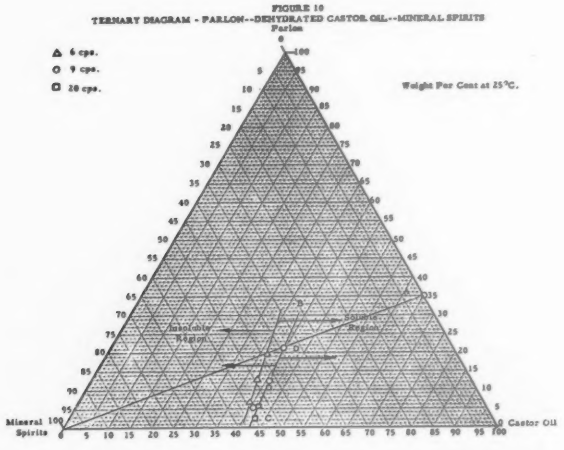
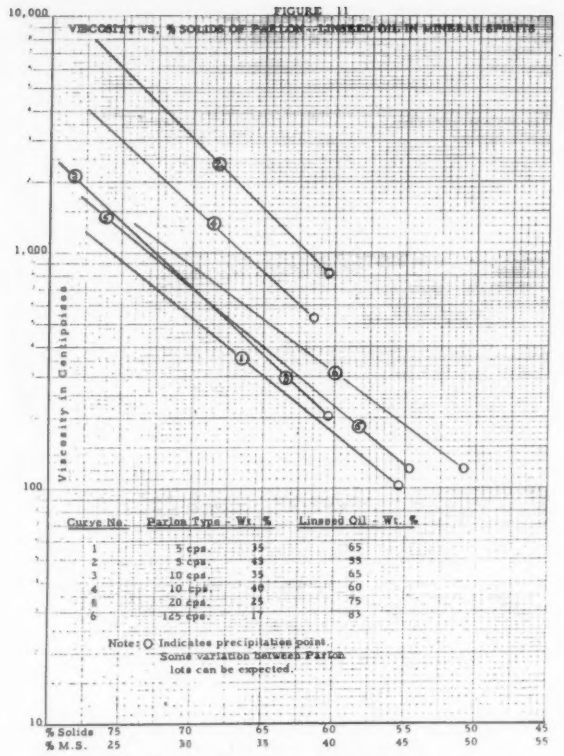


Figure 10



Curve No.	Parlon Type	Wt. %	Linseed Oil - Wt. %
1	5 cps.	35	65
2	5 cps.	45	55
3	10 cps.	35	65
4	10 cps.	40	60
5	20 cps.	25	75
6	125 cps.	17	83

Note: ○ Indicates precipitation point. Some variation between Parlon lots can be expected.

Figure 11. Viscosity vs. percent solids of Parlon (chlorinated rubber)-linseed oil in mineral spirits.

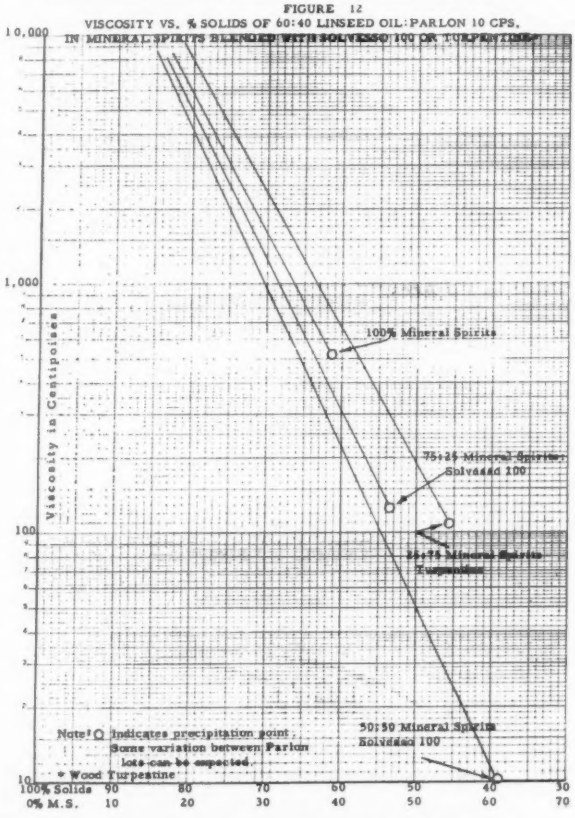


Figure 12. Viscosity vs. percent solids of 60:40 linseed oil:Parlon 10 cps in mineral spirits blended with Solvesso 100 or turpentine*.

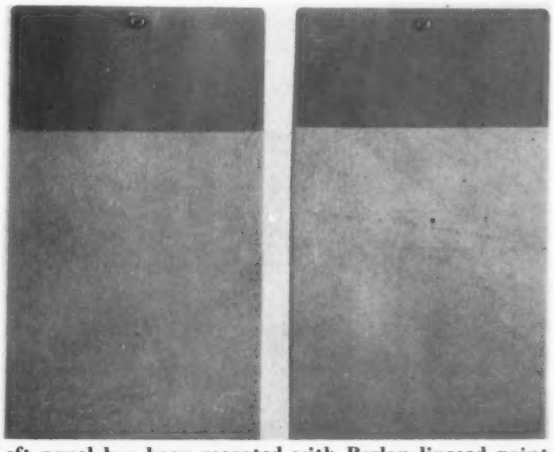
minimum viscosity of roughly 100-200 cps. or less in order to retain a brushable viscosity after pigment is added.

The curves in Figure 11 illustrate the viscosities which can be obtained by thinning chlorinated rubber —linseed oil solutions with mineral spirits. Some approximations were made on the basis of these curves. These *approximations* are tabulated in Table III.

Parlon Viscosity	Clear Vehicle Solids		Total Solids at Precipitation Point	Viscosity at Precipitation Point
	Max. Parlon	Linseed oil		
5	25 - 35%	75 - 65%	50 - 55%	100 cps. or less
10	25 - 30%	75 - 70%	52 - 55%	100 cps. or less
20	20 - 25%	80 - 75%	50 - 55%	120 cps. or less
125	10 - 17%	90 - 83%	45 - 50%	120 cps. or less

Table III. Approximate maximum concentration of Parlon for preparing brushable, primer-type coatings thinned with mineral spirits.

In order to obtain the maximum benefits that chlorinated rubber offers for more vigorous applications, it would be desirable to incorporate larger amounts of chlorinated rubber in the oil and still obtain the necessary minimum viscosity for preparing pigmented coatings. This can be done by modifying the mineral spirits thinner with an aromatic solvent, such as Solvesso 100 (Kauri-Butanol value of 90), or by using turpentine as a major replacement for mineral spirits.

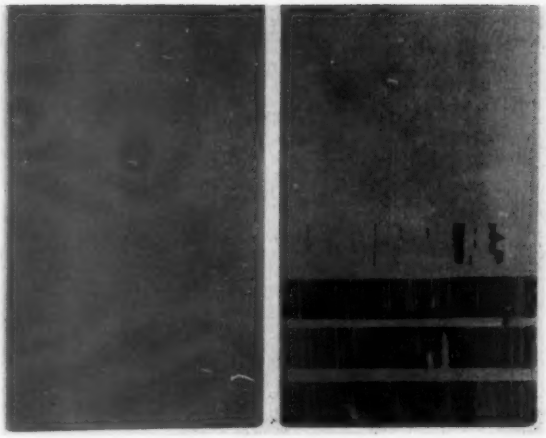


Left panel has been recoated with Parlon-linseed paint. Right panel has been recoated with a linseed oil base paint. Non-lifting properties of Parlon-linseed oil system compares with straight linseed-oil system as no difference in both panels can be detected.

Figure 12 illustrates the minimum viscosity which can be obtained by reducing 60:40 linseed oil:chlorinated rubber (10 cp. type) with modified thinners. This particular chlorinated rubber-oil system was chosen because 40% chlorinated rubber provides a very high degree of chemical resistance and film-drying properties, and the 10 cp. type may offer the best compromise between film-forming properties and thinner tolerance. Based on the curves in Figure 12, desirable thinners for the above 60:40 system are given in Table IV.

Lean Thinner Blend	Solids of 60:40 Linseed oil:Parlon S-10 at Precipitation Point	Viscosity at Precipitation Point
75:25 Mineral spirits: Solvesso 100	53.5%	125 cps.
25:75 Mineral spirits: wood turpentine	45.5%	100 cps.

Table IV. Desirable thinners for 60:40 system.



Fast drying properties of Parlon-linseed oil systems over straight linseed oil systems are shown in the above panels. Masking tape pick-up indicates relative drying speeds.

Since linseed oil has the best solvency for chlorinated rubber, slightly greater percentages of Solvesso 100 or turpentine would probably be necessary to thin similar solutions of chlorinated rubber in the other oils.

Parlon - Linseed Oil, Red Lead Primers
Starting Formulations and Properties

Starting Formulations	X9555-35	X9555-37	X9555-38	Control X9555-39
Vehicle Solids				
65:35 Raw linseed oil: Parlon S-5	196	--	--	--
60:40 Raw linseed oil: Parlon S-10	--	200	200	--
75:25 Raw linseed oil: Z_3 linseed oil	--	--	--	180
Thinners				
Mineral spirits	142	--	--	29
25:75 Mineral spirits: Turpentine	--	216	--	--
75:25 Mineral spirits: Solvesso 100	--	--	170	--
Ethanol (25% on Bentone 34)	1	1	1	1
Pigments				
97% Red lead	804	.800	800	820
Bentone 34 (0.5% on red lead)	4	4	4	4
Dyphos (4% on Parlon)	3	3	3	--
Driers				
6% Cobalt (0.05% cobalt on oil)	1	1	1	1.5
24% Lead (0.3% lead on oil)	1.6	1.5	1.5	2.3
ASA antiskin agent (0.1% on oil)	0.13	0.12	0.12	0.18
	1152.73	1226.62	1180.62	1037.98
Properties				
Total solids, %	87.4	82.2	85.3	96.8
Clear vehicle solids, %	58.0	48.0	54.0	85.6
Pigment volume concentration, %	35.0	35.0	35.0	35.0
Stormer viscosity, KU	82.0	82.0	83.0	86.0
Dry for handling, hours	10 - 12	8 - 10	8 - 10	20 - 24
Dry for recoating, hours	18 - 24	12 - 18	12 - 18	36
Sward hardness, % of glass:				
24 hours	6	10	10	2
72 hours	8	10	12	4

Table V

Formulations

Table V gives starting formulations for three chlorinated rubber: linseed oil: red lead primers. A typical unmodified linseed oil red lead primer was included as a control. The dry-time and hardness data show that the addition of 35 to 40% chlorinated rubber to linseed oil cut the drying time and time for recoating at least in half, and resulted in major improvements in hardness of the dry films. The hardness values are also an indication of the toughness of the film. The control formulation, after 24 hours,

(*Turn to page 96*)

EMULSION PAINTS

A report on some of the results of ten years activity in this field.

By
Edward C. Scholl*

SINCE their introduction, shortly after World War II, emulsion paints have become a very decided factor in the trade sales paint market. At first these paints were regarded as a passing fancy and it was the general feeling of the paint industry that they would enjoy a short run of success and then fade out of existance. Such, however, has not been the case, since every year shows a decided increase in the total gallons of emulsion paints being sold by the paint industry. When these paints first appeared on the market there was but one emulsion available, styrene-butadiene, which had been developed from the tremendous synthetic rubber program undertaken during World War II. In the intervening years, since 1948, there have appeared many new types of emulsions, such as polystyrene, vinyl acetate, in the form of homopolymer and co-polymer, acrylic emulsions, acrylonitrile-butadiene, vinylidine chloride-vinyl chloride and vinyl chloride. All of these emulsions have certain properties which render them suitable for use in paints.

The purpose of this paper will be to report some of the results of ten years activity in this field. It shall further try to resolve some of the many questions which arise regarding the use of a specific type of emulsion. A still further purpose of this paper is to attempt to clear up many of the misconceptions which have arisen over the last several years regarding the philosophy of formulation of emulsion paints.

Courtesy of the Glidden Co.

Brushes are cleaned by merely rinsing out in soapy water under tap after using vinyl latex exterior masonry paint.

When water paints first became known to the paint industry, at the close of World War I, there existed binders such as starch, dextrose, casein and soya proteins, none of which produced satisfactory paints, despite the fact that considerable pounds and gallons of these types of paint were sold.

In the early 1930's, alkyd resins were added to some of these earlier film formers to upgrade their properties as paint. However, they still fell considerably short of being considered technically sound paints. It was often said that they were merely "good whitewash". The advent of the high polymer synthetic resins, as produced by emulsion polymerization techniques, produced binders which have upgraded the quality of all types of water reducible paints. From this point, which occurred sometime in 1948, large segments of the paint industry have been devoting a good deal of time to the formulation and manufacture of the newer type of emulsion paints.

New Concepts

When the author first started to work on these paints, shortly after the end of World War II,

*President of Esco Laboratories, consultants in the paint field.
Opinions expressed in this article are the author's and do not necessarily reflect those of this publication.

he, like many others in the industry, had many conceptions and ideas as to how they should be formulated. In the intervening years, however, many of the earlier conceptions were discarded and newer theories were resolved. The early work records formulas having as many as twenty-three to thirty items in the formulation. This was a natural outgrowth of the lack of information on the part of formulators and the raw material suppliers. There were no people around with any experience in this particular field and so each formulator had to decide for himself what to use.

Basic Ingredients

Over the last ten years sufficient changes have been made, not only in the emulsions themselves, but in many of the formulating adjuncts, such as pigment, extenders, additives and the like. It is no longer necessary to put in item A to get an effect in the formulation and then to have to put in item B to off-set the side reaction that was produced with item A, with a subsequent addition of item C, to reduce or eliminate the side effect produced by item B. This is the way the industry started out in the early days. Now, however, a very fundamental philosophy in the emulsion paint technology has been reached; that is, to make the formula or recipe as simple as possible so as to prevent any upsetting of the delicate balances that exist in an emulsion. It should be noted that emulsions of the film forming resins that have been offered to the paint industry are very delicate mechanisms and if the paint formulator can keep the formulas as simple as possible, the chances are that the hazards incurred by the addition of fifteen to eighteen items will be greatly minimized. It is now the opinion of the Author that the simpler the formulation the better the final paint and the less chance of difficulties arising during manufacturing, shipping, application or shelf storage.

Experience has shown that basically all emulsion paint formulas, regardless of binder used, should contain the following ingredients:

A. Primary white pigment.
B. Extender pigment.
C. Simple dispersing agents and pigment protective colloid.
D. Water soluble fungicides.
E. A natural occurring protein as a protective colloid and thickener.
F. Water reducible or water soluble antifoam.
G. Film forming emulsion.
H. Water.

This reduces to simple terms the experience gained by the author since work was first undertaken with these paint systems. It is the well considered opinion of the author that all ingredients which are used in an emulsion paint system should either be water reducible or water soluble. They should in no way have properties which would tend to take from the basic film forming emulsion any of its emulsifying agents, dispersing agents, or protective colloids.

One other concept, which has grown as a result of the amount of work done in this field, is that pH control is by far the largest single factor responsible for stability of finished emulsion paints. It should be emphasized that the control of pH is of paramount importance to every paint formulator who is attempting to make an emulsion paint.

Courtesy of the Dow Chemical Co.

Applying latex paint on exterior masonry surface.

Another factor that few people have recognized, or are willing to recognize, is that the addition of casein or other natural occurring proteins is the most important formulating aid in emulsion type paints. Experience has shown that regardless of the vehicle used, if it is an emulsion of a synthetic polymer, its flow characterists and brushing are greatly enhanced by the addition of casein or other type protein. There has been nothing developed over the last ten years which will perform the functions in an emulsion paints that these colloids do. Most people have a particular aversion to the use of casein or protein in paints because of experience during World War II when oils for paint making were in short supply and many manufacturers added a water reducible paint to their line, knowing little or nothing about solublizing these proteinaceous binders, and still less about protecting them against putrification. They ran into great difficulty and attributed all their problems to the casein or protein and not to their own lack of knowledge. Properly cooked and properly handled, proteins enhance the properties of any water reducible paint.

Pigment Dispersion

There are other factors that must be considered in latex paint formulation. Too little thought or work has been given to the problem of pigment dispersion in emulsion systems. The paint industry could learn from the paper coaters, who for the past half-century have known how to get the maximum effect out of pigments in a water dispersed system. There has been a good deal of "hog wash" disseminated throughout this industry regarding water demand of mineral extender pigments. As far as the author is concerned, water demand does not exist. It is recognized that this statement is almost heresy. However, using a specific illustration to prove a point—kaolinite clays have always been thought of as having high water demand. However, what the paint industry has failed to recognize is that the paper coater prepares dispersions of clay in water at 71% to 72% pigment solids, with water-like viscosity. To continue further along this same train of thought, clay exists at a fineness of less than two microns as flat single plates, above two microns these plates exist as stacks, much like a deck of cards. Many people have the idea that fine particle sizes increase the water demand because of greater surface area of the pigment. It has been found that in a properly dispersed system it makes very little difference whether the pigment particles are less than two microns or larger than two microns, the resulting viscosity will be the same at any pigment solids concentration, provided the system is completely dispersed. The only thing that the fine particle sizes do is to increase the gloss of the final film.

Some seventeen different types of extender pigments were examined and the conclusions drawn are that:

A. All extender pigments require a specific amount and specific type of dispersing agent to obtain maximum dispersion.

B. Regardless of chemical composition, if the particle size distribution of these pigments are identical, the resulting paint properties are also identical, provided that maximum dispersion is obtained.

C. The only extender that actually has shown water demand is Diatomaceous Silica. This is because of the peculiar type of crystal formation.

Courtesy of the Dow Chemical Co.

Latex paints may be rolled on in any direction. With latex paint keep the roller loaded sufficiently so that the surface is thoroughly painted with two passes of roller made at right angles to each other.

As further proof of the above statements, dispersions of titanium dioxide at 80% solids in water have been produced. The fluidity of these dispersions was very low and when the dispersion was drawn down on a Morrest Hiding Chart, a very high gloss was apparent, even though no binder was present, indicating optimum dispersion of this pigment.

To draw an analogy between the preparation of an emulsion of the synthetic polymers used as paint film formers and the preparation of a pigment dispersion seems to be in order. The emulsion of the film formers are substantially permanent hetrogenous mixtures suspended in water and kept separate through the use of dispersing agents, emulsifying agents, and protective colloids. A pigment dispersion is also a hetrogeneous suspension of pigment particles in water. To keep this system permanently separated, it is necessary to use dispersing agents and protective colloids. Unless a protective colloid for the pigment dispersion is present, the dispersion will flocculate or separate out upon standing. Flocculation in a pigment dispersion is essentially the same as coagulation in an emulsion. Furthermore, unless the pigment particle is completely surrounded by dispersing agent and protective colloid, it will rob from the emulsion of the film former some of its dispersing agent and protective colloid, with the result that incompatibility and instability of the finished paint usually occurs.

It is important, therefore, that the formulator recognize that a properly prepared and protected pigment dispersion is important in the preparation of emulsion paints. By good dispersion of pigment in a water system, reference is not being made to the fineness of the grind as much as it is being made to the separation of the pigment particles during dispersion and then maintaining them in a permanently separated condition through the use of a protective colloid for the pigment dispersion.

Best Emulsion?

On numerous occasions the author has been asked as to which emulsion makes the most satisfactory trade sales paint. This question cannot be resolved by a direct answer as to the relative merits of any single emulsion. Several factors must be taken into consideration, such as: type of paint, quality requirement, cost requirement, available processing equipment, sales department's desires and etc. In order to clarify the many statements being disseminated to the paint industry regarding the properties of the various emulsions being offered for sale, an attempt will be made to set up the three different types of trade sales paints now being produced from emulsions.

Thus, the first paint for discussion will be:

Primer-Sealer: All the work to date has indicated that in this particular type of paint the polyvinyl acetate emulsions are the most satisfactory emulsions to use. These paints can be formulated at relatively low raw material cost. They flow and brush well enough so that subsequent top coats will not reflect any of the brush marks, they allow painting of oleoresinous

(*Turn to page 97*)

CONTRACTORS GET VIEWS ON LATEX PAINTS

NEW resin emulsion paints were discussed by a panel of experts as a part of the program of the Middle Atlantic Conference, Painting & Decorating Contractors of America, held in Philadelphia November 8-10. Panel members were J. E. Spector, Luminall Paints, who spoke on butadiene styrene paints; E. H. Grant, Devoe & Raynolds Company, who spoke on polyvinyl acetate paints; and Gerould Allyn of Rohm & Haas Company, who showed slides and talked about acrylic paints.

The painting contractors present raised a number of questions in the discussion period which were of general interest. A summary of these questions follows:

Is it desirable to thin the three types of latex paints before application?

In some cases a small amount of water may be added to the emulsion paints, particularly where a very dry surface is to be coated. This will supply some of the water needed to wet the surface. Another and often preferable method is to wet the surface before applying the paints. This is particularly helpful on porous masonry and cinder block. Painters got into the habit of thinning oil type and alkyd paints because they were more difficult to brush, but these water paints brush on so easily there is generally no need to thin them. This gives a more uniform coat and avoids the lapping and streaking marks characteristic of an over-thinned alkyd or oil paint.

Can we get a gloss resin emulsion paint?

Some of the resin emulsion paints on the market today have some sheen, but a full gloss is not yet practical.

Can you use all three types of latex emulsion paints on interior and exterior woodwork?

Water may tend to raise the grain of some types of uncoated wood although there have been many successful applications of emulsion paints directly on bare wood for interior work. For exterior work it is important that a coat of oil paint be applied first to the surface.

Will these paints work as undercoats?

The new latex type paints do an excellent job as undercoats on wood if there is not too much grain raising. Then a coat of oil paint can be applied promptly since the resin emulsion paints will dry in an hour or less and a very good job results.

One of my customers had steel stair treads to protect and someone took them out and put on a very heavy rubbery type coating. Was this paint?

The chances are this was an organosol which must be applied in a factory and baked. It is not paint and this type of product generally could not be applied by the painter.

Should brushes be wet before using them with water based paints?

It is an excellent idea to dip the brush in water to supply the water demand of the bristles. Another suggestion is to rub up the brush with a strong soap solution and work the soap into the heel of the brush. After use the brush can then be washed out more easily.

What type of brush is preferred for water paints?

In general the bristle type brushes soften considerably in water base paints. Tapered nylon brushes retain their elasticity better.

How can you clean a brush which has been allowed to dry overnight with the various latex paints in it?

This is pretty hard on brushes, but sometimes they can be cleaned satisfactorily. The commercial brush cleaners work fairly well and after allowing the brush to stand in them for a few hours bristles can be combed. Generally a brush should not be allowed to stand over night in these cleaners. Another possibility is the use of strong lacquer solvents which helps to cut dried paint of this sort. Still another material which could be used is pine oil. This is not as hard on the brush as the lacquer solvents. Most contractors find that they should ask their men to keep a pail of water handy and every hour or two the brush can be dropped in the pail of water and a fresh brush taken from the pail. This prevents paint build-up.

I find that paint builds up inside the cap of the spray gun. What can be done about this?

This depends somewhat on the type of spray gun, but fast drying emulsion paints sometimes do this. One of the best methods of preventing build up is to coat the inside of the cap with a little Vaseline before starting. This prevents accumulation on the cap.

I coated the ceiling of a room with a butadiene styrene latex paint and six months later it showed considerable yellowing. What caused this?

There are various types of butadiene styrene paints and undoubtedly the one referred to was alkyd modified. Alkyds or oils show more yellowing than the latex type paints so a suitable selection of paint is important for best color retention.

Can I use oil colors to tint latex paints?

Unless the manufacturer specifies that oil colors can be used the answer is "no". Sometimes very small amounts of oil colors can be worked in, but larger quantities will lump and streak.

What kind of tinting colors can be used with latex paint?

Generally the manufacturer specifies a particular type of tinting color often a universal or an aqueous type. Also the white paints can generally be tinted with colored paints of the same brand since they have the same base.

Can we mix all three types of latex paints without worrying about the type?

Polyvinyl acetate paints generally cannot be mixed with either acrylic or butadiene styrene although most acrylic and butadiene styrene paints can be mixed together satisfactorily.

The author continues his random reflections on various aspects of the paint industry. The opinions expressed in this column are his alone and do not necessarily reflect those of this publication.

Research Currents

"WHAT this country needs," an old saying used to go, "is a good five-cent cigar." And what this paint industry needs, in my humble opinion, is something the biochemists have had for the past ten years—a comprehensive volume of lucid and stimulating essays covering recent progress in various aspects of their field.

It was just ten years ago that Interscience Publishers brought out "*Currents in Biochemical Research*," edited by *David E. Green*, of the Institute for Enzyme Research, University of Wisconsin. Now the same publishers and editor follow up with "*Currents in Biochemical Research 1956*."

In a review of this new book in the *Journal of the American Chemical Society*, *Jesse P. Greenstein*, of the National Institute of Health, quotes editor Green as stating that, "The past decade has witnessed a rate of progress vastly greater than any comparable period since the early beginnings of biochemistry as a science more than 100 years ago. There is little doubt that this phenomenal rate of development has been sparked by a revolution in methodology."

Dr. Greenstein seems to think, however, that the distinction between progress in ideas and progress in the development of machines should be made very clear. He bemoans the fact that the rate of production of penetrating concepts and ideas has not kept pace with the development of modern tools and techniques which he terms, somewhat disparagingly, just "engineering and technical progress."

Phil Heiberger

Says Greenstein, "Some of the questions raised by Emil Fischer have been answered by recent chromatographic techniques, and the newly hatched doctor of philosophy can turn out results faster and with higher precision than could Pasteur. Perhaps we should merely say that modern biochemistry is no better and no worse than in the days of Fischer and Pasteur, that its rate of production of penetrating concepts and ideas has not measurably changed, but that, thanks to modern tools, it may move a little faster."

Whether we agree with reviewer Greenstein or take the more optomistic view of editor Green is a moot point. Not being a biochemist, I don't feel qualified to take issue, although I am inclined to side with Greenstein. But when it comes to the paint field, I do have a definite opinion. Here, I believe, the opposite is true. Here the methodology lags behind the ideas.

Oh yes, it's true we do have many tests and analyses for paint and film performance. But where are the reliable accelerated tests for weathering, film behavior, package stability, and the like? Confess—aren't many of our tests empirical and don't many fail to correlate with actual performance?

Consider the impact to the industry if someone were to develop a reliable accelerated weathering test.

Perhaps the availability of a comprehensive book of this type, critically and fearlessly written, and focused on paint chemistry, could help us gain the perspective necessary to indicate our needs, thereby hastening satisfaction of these needs.

Chemical Engineering Studies

BASIC chemical engineering studies on paint manufacturing processes are hard to come by. More often than not, we borrow from neighboring industries.

In 1956, a short course on Unit Processes in the Fatty Oil, Soap, and Detergent Industries was sponsored by the American Oil Chemists Society at Purdue University. These lectures were printed in the November issue of the *Journal of the American Oil Chemists Society.*

Of particular interest to paint and vehicle production people are the lectures on (1) Heat Transfer and (2) Pumps and Compressors, by Lyle F. Albright, (3) Principles of Mixing in the Fatty Oil Industries, by J. Henry Rushton, and (4) Automatic Control by John W. Tierney.

Chromatographic Determinations

TALKING about young fields growing fast, chromatography certainly fits into this category too. Five or six years ago when I was first introduced to its then novel techniques, reviewing and keeping up with the literature was a breeze. Now the libraries are burdgeoning with chromatographic references.

It seems that almost every conceivable complex mixture has been separated by one or another of the numerous chromatographic techniques now available.

The latest chromatographic feat to catch my eye was reported in *Khim. i. Technol. Topliva 1956, No. 3, 51-3. (Chemical Abstracts 1956, page 12758). Losikov, Kaverina, and Fedyantseva* developed a method for the fractional separation of polymers (e.g., polymethacrylates, polyisobutylene, and others) used as additives in lubricating oils.

Activated charcoal and colloidal silica were found to be good adsorbents. 2-methylheptane was used as the solvent and as a developing agent in the initial stage, substituted with benzene in the final stage. Molecular weights of the separated fractions were determined with an average accuracy of ± 300. The optimum separation was achieved in a glass column 1800 mm. long, with 150 grams of either adsorbent, and with 28-30 grams of polymer sample dissolved in a 1:10 ratio of the solvent.

For comparison, samples of polyisobutylene, molecular weight 18,000 polymerized by BF_3 catalyst, and molecular weight 27,000 obtained with $AlCl_3$, were analyzed by fractional precipitation with butyl alcohol from their solutions in 2,4,4-trimethylpentene. The plots (% fraction vs. molecular weight) of chromatographic results agreed with the fractional precipitation data.

$9,000,000 Per Pound

APPARENTLY tired of playing "perennial detective" in supporting roles, the new synthetic radioelements may branch out as raw materials. We're all acquainted with the use of radioelements as tracers in control, analysis, research, and inspection. Now we meet one of them, Technetium, in the guise of an effective corrosion inhibitor for steel—a raw material in its own right.

The September 1956 issue of the British *Paint Manufacture* reports that at the rate of $20 per milligram, Technetium may be available for use in corrosion prevention.

It seems that potassium pertechnicate added to a corrosive solution in the proportion of one part of pertechnicate to 200,000 parts of solution will prevent corrosion even at temperatures above 400° F. Reports are that salts of technetium inhibit the corrosion of mild steel for two to three year periods.

More on Irradiation

THE ever increasing background of irradiation data has made little impact on the paint industry to date. But the time will come (maybe soon) when such data, by sheer volume, will force us to stop, look, listen, and act.

For example, it is now known that the irradiation of polyethylene containing carbon black results in a product with greatly improved mechanical properties. This is attributed to the formation of multiple links with the carbon black particles.

M. Szwarc in a paper "*Action of Carbon Black in Stabilizing Polymeric Materials*" (J. Polymer Sci. *19*, 589 (1956)) sheds further light on this mechanism.

Apparently carbon black exhibits free-radical properties, due to irregularities in the graphite structure, and the active centers formed by these irregularities result in covalent bonds with free radicals. Aromatic compounds can also act as radical traps, suggesting that graphite would act analogously.

Does this imply that our whole concept of pigment-vehicle interactions requires reevaluation? Once we start thinking in terms of irradiation or free-radical activated "cures", maybe it does.

All That Glitters

WHICH would you choose? A fictional "Solid Gold Cadillac" or an honest-to-goodness gold-plated Ford?

The former's a sure bet for laughs right now, but unless the best laid plans of Ford Motor researchers go astray, the latter may well spell real cool comfort some summer soon. Here's the gimmick.

According to *Chemical and Engineering News*, December 10, 1956, Ford has discovered, in its light insulating studies, that thin films of gold on auto windshields and window glass filter out the sun's heat-producing rays while permitting cooler beams of light to pass. Gold foil and a glass plate are placed in a bell jar. Vacuum is applied and the gold is melted electrically; gold vaporizes, coating the glass.

All that glitters can be a protective coating too!

A New Chromatographic Technique

PAINT chemists and biochemists can now rejoice. A new chromatographic technique, of vital interest to both, has been developed. In a paper entitled "Separation of Small Quantities of Saturated Higher Fatty Acids by Reversed-Phase Paper Chromatography," B. D. Ashley and U. Westphal (Arch. Biochem. Biophys. *56*, 1 (1955; J. Am. Oil Chem. Soc. *32*, 541 (1955)) report methods for the separation of small quantities (of the order of 10-50 micrograms) of C_{22} to C_{24} saturated higher fatty acids.

This technique is of concern to biochemists because, they tell me, brain liquids are complex mixtures of saturated fatty derivatives, and studies into brain biochemistry had been stymied by the lack of such a method.

NEWS

R. T. Yates

Hercules and Imperial Form New Corporation

Richard T. Yates has been elected president of a new company formed by Hercules Powder Co. and Imperial Chemical Industries, Ltd. The new company, with Hercules and Imperial each owning 50 per cent, will build and operate an 11 million dollar plant for the manufacture of methyl methacrylate.

It was announced that the new company's name will be Hawthorn Chemical Corp. The new plant, with an annual capacity of 35 million pounds, will be built at Louisiana, Mo., adjoining Missouri Ammonia Works, owned and operated by Hercules. The administrative offices of the company will be located in Wilmington, Del.

For the past four months Mr. Yates has been on special assignment from Hercules in connection with the formation of Hawthorn Chemical Corp. Prior to this assignment, he was manager of the Agricultural Chemicals Division, Naval Stores Department of Hercules.

Methyl methacrylate, key product of the new corporation, is a chemical made by only two other companies in the United States. At present its main application is as a plastic polymer for products used in aircraft, automobiles, and illuminated signs. The new company will make and sell both monomer and polymer in various forms.

JUDGING TECHNICAL DISPLAYS at the recent 1956 annual technical symposium for personnel of the Paint ,Varnish and Lacquer Division of the Sherwin-Williams Co. are: (L to R) M. B. Robinson, Fenn College; Dale E. Barbee, Case Institute of Technology; and Mrs. Bess Bar LeBedoff, Western Reserve University. A. B. Holton, technical director of the division, is with them.

Task Group From Industry Aids Government Study

James C. Konen, vice president, research, for Archer-Daniels-Midland Co., Minneapolis, recently was named to head one phase of the government's efforts to improve the farm economy. As chairman of a task group on oil-seeds and animal fats, Mr. Konen directed a study of new and expanded uses for those commodities.

The group was one of several selected by the President's Bipartisan Commission on Increased Industrial Use of Agricultural Products. Congress established the commission at its last session with instructions to make recommendations for greater utilization of products not needed for human or animal consumption.

Basic purpose of the commission and its task groups is to increase farm income, Mr. Konen said. With that in mind, his group reviewed the economic situation of oilseeds and animal fats as well as present and potential uses.

Mr. Konen said his group's report to the commission was due by January 8. The commission is to report to Congress before next June 15.

The group's report, according to Mr. Konen, was expected to possibly suggest entirely new uses for the oilseeds and animal fats, new legislation affecting these commodities, or other proposals aimed at increased consumption. In addition, the report was to estimate the future volume of the commodities available for industrial uses with full agricultural production and increased efficiency in farming.

Serving with Mr. Konen on the oilseeds and animal fats group were: Dr. Waldo Ault, head of the animal fats section of the eastern regional research laboratory of the Department of Agriculture; Harry S. Baker, president of the National Cottonseed Processors Assn. and of the Producers Cotton Oil Co.; Marshall Ballard, Jr., president of the American Tung Oil Assn.; Don S. Bolley, technical director of the Baker Castor Oil Co.; and John J. Hamel, Jr., of the National Renderers Assn.

Also, Wesley Hardenburgh, president of the American Meat Institute; Willard Lighter, vice president, chemurgy division, Glidden Co.; George S. Prichard, executive secretary of the National Flaxseed Processors Assn. and representative for the National Soybean Processors Assn.; Dr. Herbert E. Robinson, director of laboratories, Swift & Co.; and Robert Van Tuyle, vice president in charge of manufacturing and research, Emery Industries.

Baker Appoints Gillies, Inc.

The Baker Castor Oil Co. has reported the recent appointment of Gillies, Inc. as its exclusive representative in the Denver-Salt Lake City area.

With an office in Denver, Colo., Gillies, Inc. will handle sales of all Baker products in Colorado and Utah.

NEWS

Paint Technology Courses Offered By Rutgers U.

The Adult Center at Rutgers University, Newark, N. J., will offer two courses in paint technology during its spring term, beginning January 28. One of these courses is in fundamentals and the second a more advanced subject on the latest methods in varnishes, pigments, coatings, and finishes.

William Lawrence, Technical Director of Trade Sales Finishes of Flood and Conklin Manufacturing Co., will instruct both classes. Guest lecturers and field trips are also scheduled.

In the new fundamentals course, scheduled to be held on Wednesday evenings, Mr. Lawrence will cover the basic principles of formulation; the study of oils, resins, and solvents; varnishes and alkyd resins; lacquer and emulsions; white, colored, and extender pigments; driers and addition agents; processing and control equipment; color matching; and relating products to sales.

His advanced course, on Monday evenings, will include the latest developments of varnishes and alkyds; use of epons, vinyls, and silicons; new types and uses of pigments; latest methods of dispersing pigments; formulation principles of architectural coatings; and formulation of maintenance, industrial, lacquer, and specialty finishes.

Details regarding either the "Fundamentals of Paint Technology" course or the "Advanced Principles of Paint Technology" course may be secured at the Adult Center, Rutgers, The State University, 53 Washington St., Newark.

•

Du Pont Acquires New Site

Title to a 67-acre site near Dayton, Ohio, has been obtained by E. I. du Pont de Nemours and Company for $67,000.

Du Pont will build an auto paint factory on the new site, and expects to begin production later this year.

NEW BASE: Sinclair Paint Co., Los Angeles, Calif., has transferred its general offices and production facilities to the above five acre site at 3960 E. Washington Blvd., Los Angeles. The move greatly increases the production capacity of the company and will make Sinclair one of the largest independent paint manufacturers on the West Coast. Included among the operations at the current location is the start of a new Industrial Division for the manufacture of lacquers and industrial coatings.

Carver Elected Chairman For ACS Division of Paint

J. Kenneth Carver of the Dayton, Ohio, Central Research Laboratory of Monsanto Chemical Co., has been elected 1957 chairman of the American Chemical Society's Division of Paint, Plastics and Printing Ink Chemistry. He succeeds Dr. Russell B. Akin of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Professor L. Reed Brantley, head of the department of chemistry at Occidental College, was chosen chairman-elect and Dr. Allen L. Alexander, head of the Protective Coatings Branch of the Naval Research Laboratory, Washington, D. C., was named vice-chairman. The new secretary-treasurer is Ernest R. Mueller of the Battelle Memorial Institute, Columbus, Ohio.

Named to represent the division on the ACS Council was John K. Wise of the U. S. Gypsum Co., Chicago. Arthur K. Doolittle of Carbide & Carbon Chemicals Co., South Charleston, West Va., will be alternate councilor.

Mr. Carver, an authority on plasticizers, holds several patents and has written numerous scientific articles. In 1943 he founded the Plastics Club of St. Louis, which has been consolidated with the Society of Plastics Engineers.

NPVLA Hears Federation Plan For Paint Institute

Preliminary details of the Federation's plan to establish a Paint Research Institute were announced by Milton A. Glaser, president of the Federation of Paint and Varnish Production Clubs, in an address before the 69th annual convention of the National Paint, Varnish and Lacquer Association.

In commenting on the progress of the proposed plan, Mr. Glaser stated that the Long Range Planning Committee of the Federation had been investigating arrangements and sites for such an institute for the past three years. The preliminary recommendations of the Long Range Planning Committee, he said, have been approved in principle by the Federation Board of Directors.

Mr. Glaser reported that it was the expressed desire of the Board of Directors that the Long Range Planning Committee work out the details for a Federation-sponsored Paint Research Institute as expediently as possible. The purpose of the institute would be to conduct broad research and to foster technical education for the benefit of the entire decorative and protective coatings industry.

Members of the Long Range Planning Committee are: Newell P. Beckwith, Rinshed-Mason Co.; Hiram P. Ball, Ball Chemical Co.; Mr. Glaser, Midland Industrial Finishes Co.; C. Homer Flynn, Executive Secretary of the Federation; and Calvin J. Overmyer, Elliott Paint and Varnish Co.

NEWS

New Consultant Company Serves Aerosol Industry

The formation of a new consultant firm for the rapidly expanding aerosol industry has been announced by Frederick G. Lodes, aerosol pioneer and executive. The new organization, Lodes Aerosol Consultants, Inc., 730 Fifth Ave., New York City, will devote itself exclusively to the problems of pressurized packaging.

F. G. Lodes

Lodes Aerosol Consultants will serve clients now in the aerosol industry, as well as corporations on the outside wishing to expand or diversify by entering this field. The firm will specialize in the broad areas of technical assistance, consultation concerning the foreign aerosol market, and surveys relating to proposed business acquisitions.

•

Troy Chemical in Merger

The merger of Milton Goll Associates, Livingston, N. J., with Troy Chemical Corp. has been announced by Elias Singer, President of Troy Chemical Corp. The firm will maintain offices, laboratories and factory in Newark, N.J.

Troy Chemical Corp. will manufacture, market and service a wide line of fungicides and bactericides (mildewcides and preservatives). Milton Goll is to serve as Vice President in charge of industrial anti-microbial agents, bearing the trade name "Troysan."

•

Cellofilm Names Agent

Cellofilm Industries, Inc., Woodridge, N. J., has announced the appointment of Baird Chemical Corp., New York, N. Y., as sales representatives.

According to Arthur M. Golden, executive vice president of Cellofilm, the move is designed to utilize the national and overseas sales facilities of the Baird chemical service organization.

FPVPC Grants Awards To Chemistry Students

Grants-in-aid, in the sum of $250 each, have been awarded to 10 chemistry students at North Dakota Agricultural College by the Federation of Paint and Varnish Production Clubs, technical association of the protective and decorative coatings industry.

Recent recipients of scholarship grants from the Federation of Paint and Varnish Production Clubs are: (L to R) David Anderson, James Young, Betty Thompson, Patrick McIlwain, William Lantz, Norman Vennerstrom, Melvin Weber, David Bragg, Mary Hess, and Homer Rothfusz.

Three of the students are residents of Fargo, N. D., the city in which the college is located. They are: Mary Ann Hess, William L. Lantz, and Norman B. Vennerstrom.

The other recipients of the grants are: David J. Anderson, Fergus Falls, Minn.; David B. Bragg, Mandan, N. D.; Pat K. McIlwain, Hankinson, N. D.; Homer Rothfusz, McIntosh, N. D.; Betty C. Thompson, Voltaire, N. D.; Melvin R. Weber, Ashley, N. D.; and James P. Young, Langdon, N. D.

Each of the students is now enrolled in the School of Chemical Technology, Dr. R. E. Dunbar, dean. In their senior year they will take courses in paint technology under Dr. Wouter Bosch, chairman of the Department of Paints, Varnishes, and Lacquers.

T. F. Gowdy Co. Appoints

T. F. Gowdy Co., New York City, has announced the appointment of the following agents to handle the sales of "Selected Fish Oil": Gillies Chemical Corp., San Francisco and Los Angeles, Calif.; Gillies, Inc., Denver, Colo.; and Gillies Western Corp., Portland, Ore.

Company also notes that it has changed its New York address. The T. F. Gowdy Co. is now located at 26 Broadway, New York 4, N. Y.

•

Columbian Carbon Moves

Columbian Carbon Co. announces it has moved its Akron, Ohio, headquarters to its own new building located at 452 East Market St.

The new plant houses Columbian's area sales and technical staffs. It is headquarters for servicing all the rubber plants between the Mississippi and the New York area.

Treatments For Metals Is Topic of N.Y. Paint Club

E. A. Stockbower, Manager of the Technical Standards Department, American Chemical Paint Co., was the featured speaker at the monthly meeting of the New York Paint and Varnish Production Club, held January 3. His topic was "Chemical Treatments For Metal."

In his talk, Mr. Stockbower covered various subjects on chemical treatment of steel, aluminum and zinc. Among these were: Quality Control Methods as Applicable to Production Lines; Application Methods of Chemical Treatment; Typical Quality Difficulties Encountered in Industry; Chemical Treatments in the Maintenance Paint Field; Applicance and Automotive Trends in the Chemical Treatment Field; and Trends in the Industry.

4 STAR SERVICE

makes Continental Steel Containers your best buy

ICC-APPROVED TIGHT-HEAD PAILS

Capacity 5 gallons. Made from heavy 24- or 26-gauge steel. Meets ICC specifications 17E and 37D. High-strength body available with straight sides or top and bottom beads. Drum top offset for easy stacking. Electric lap-weld side seam, and compound-lined, double-seamed head and bottom.

For full specifications on all Continental steel containers, contact your nearest Continental representative.

When you purchase steel containers, get the most for your money. This means the best in *service* as well as the best in pails and utility cans. At Continental, we go all out to give you what you're looking for—with our 4-star steel container service.

1 FULL LINE

Whatever product you're buying for, Continental has just the size and style container to fit it. Handi-Cans in 2½ and 5 gal. sizes, lug cover pails from 2 to 12 gal., flaring pails from 3½ to 6½ gal., plus 5 and 6 gal. tight-head pails.

2 QUALITY

Made of heavy-gauge steel in ultra-modern plants, Continental steel containers are thoroughly tested to meet ICC specifications and to conform to CFC/UFC Rule 40. Colorfully lithographed, these sturdy, reusable containers will continue to promote your product long after their original contents have been emptied.

3 RESEARCH

As part of our 4-star service, customer research men are available to help you right in your own plant. In addition, scientists at our Research and Development Center in Chicago are constantly working to bring you new and better packaging ideas—such as Continental's Perma-Linings for hard-to-hold products.

4 QUICK DELIVERY

Just say the word and we'll deliver all the steel containers you can use—any time, any place. Continental's excellent production facilities and carefully selected warehouse points in many sections of the country guarantee better service when and where you need it.

So get full value from your purchasing dollar—with Continental's 4-star steel container service. Call anytime.

TAILOR-MADE PACKAGE SERVICE

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

NEWS

Canadian Institute Plans Twin Coatings Programs

The 11th Divisional Conference of the Protective Coatings Division of The Chemical Institute of Canada will be held in Toronto, February 21, at the Seaway Hotel, and in Montreal, February 22, at the Ritz Carlton Hotel. The same program is scheduled for both cities. This continues the successful two-city meetings that the Division inaugurated in 1953.

The speakers and their topics will include the following:

Considerations in the Processing and Uses of Pentaerythritol Alkyds, W. M. Kraft, Heyden Chemical Corp.

New Developments in Inorganic Coatings, J. K. Hossack, Ferro Enamels (Canada) Ltd.

Coatings Evaluation and Laboratory Correlation with Field Experience, W. N. B. Armstrong, Ontario Research Foundation and J. W. Suggitt, Hydro-Electric Power Commission of Ontario.

Coatings for High Speed Aircraft, R. R. Hunter, A. V. Roe Co.

The Properties and Uses of Some Organic Compounds of Titanium, W. B. Anderson, Titanium Pigment Corp.

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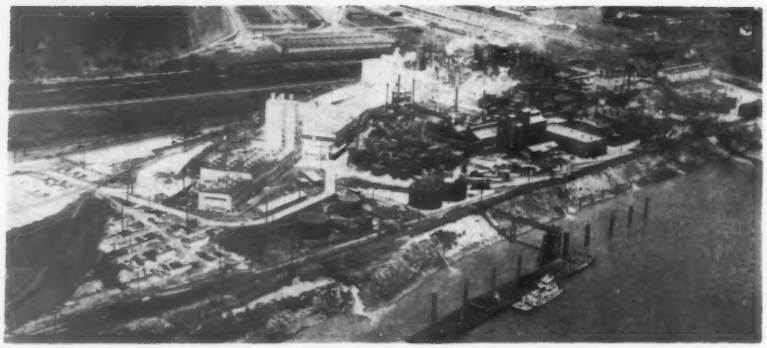
ADM Buys Into Holland Firm

Archer-Daniels-Midland Co., Minneapolis, has purchased an interest in a leading Holland manufacturer of resins and plasticizers, according to T. L. Daniels, ADM president.

The concern involved is Scado Kunstharsindustrie, N V, with plant and offices at Zwolle. Under terms of the transaction, its name will be changed to Scado-Archer-Daniels, N V. The size of ADM'S investment was not disclosed.

ADM has licensed Scado to use its formulas and know-how in the manufacture of ADM resins, copolymers and plasticizers, Mr. Daniels stated. He said the European company will serve primarily the Netherlands and Belgium but will also engage in export marketing.



TO BE ENLARGED: National Lead Co. will begin immediate construction of a new addition to the above titanium pigment plant in St. Louis. The expansion is expected to add 25,000 tons of titanium dioxide to the plant's annual capacity. Completion is scheduled for mid-1958.

N.Y.U. Gives Paint Courses

Dr. Myron A. Coler, consulting engineer and technical director of the Markite Co., New York, and Elias Singer, president of the Troy Chemical Co., New York, will teach a course on the "Fundamentals of Paint, Varnish, and Lacquer Technology" during the 1957 spring semester at New York University's Division of General Education. The class will meet on Wednesday evenings beginning February 6.

A second surface technology course, a seminar on "New Developments in Organic Finishes," will be offered on Tuesday evenings beginning February 5. Dr. Coler, Mr. Singer, and Sidney Lauren, chemist in the finishes section of the Johns Manville Research Center, Manville, N. J., are the instructors for the seminar.

Further information can be obtained from the Division of General Education, New York University, One Washington Square North, New York 3.

Witco Buys Ultra Chemical

Witco Chemical Co. has acquired all of the outstanding stock of Ultra Chemical Works, Inc., of Paterson, N. J. Accordingly, Ultra will now operate as a wholly owned division of Witco.

Ultra Chemical Works, Inc. is a large producer of detergents, detergent additives and other synthetic organic chemicals.

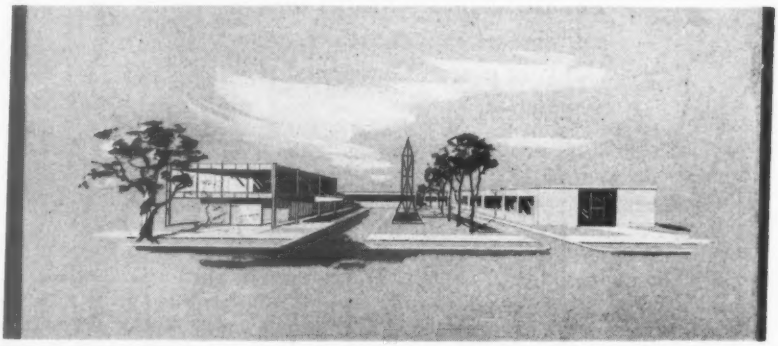
Witco manufactures a diverse line of industrial chemicals for the paint, plastics and other industries.

•

Barrett Boosts Phenol

Barrett Division, Allied Chemical & Dye Corp., has announced that a substantial expansion of synthetic phenol capacity at its Philadelphia, Pa., plant will be completed shortly.

As a result of improvements developed by the Allied Chemical Central Research Laboratory and Barrett engineers, the plant, which was placed in operation about three years ago, will have nearly twice the capacity of the original installation.



RESIN RESEARCH: In November ground was broken for a new Resin Research Center on premises occupied by Resin Research Laboratories, Inc., Newark, N. J., and its sister company, Polymer Engineering and Development Corp. The new Center, designed along lines of the above sketch, will consist of eight buildings, one of which will be equipped as a complete radiation laboratory.

Compare the superior advantages

Finishes made from BAKELITE Brand Polyvinyl Acetate Latex WC-130 demonstrate marked and important advantages over other types of materials. This is true both in production and in performance. Test WC-130 . . . and make your own comparison. For sample and complete technical data write Dept. WC-153.

- ★ **Color Retention, Non-Yellowing**
- ★ **Early Hardness, Non-Oxidizing, Less Imbrittlement**
- ★ **Viscosity Stability**
- ★ **Excellent Leveling**
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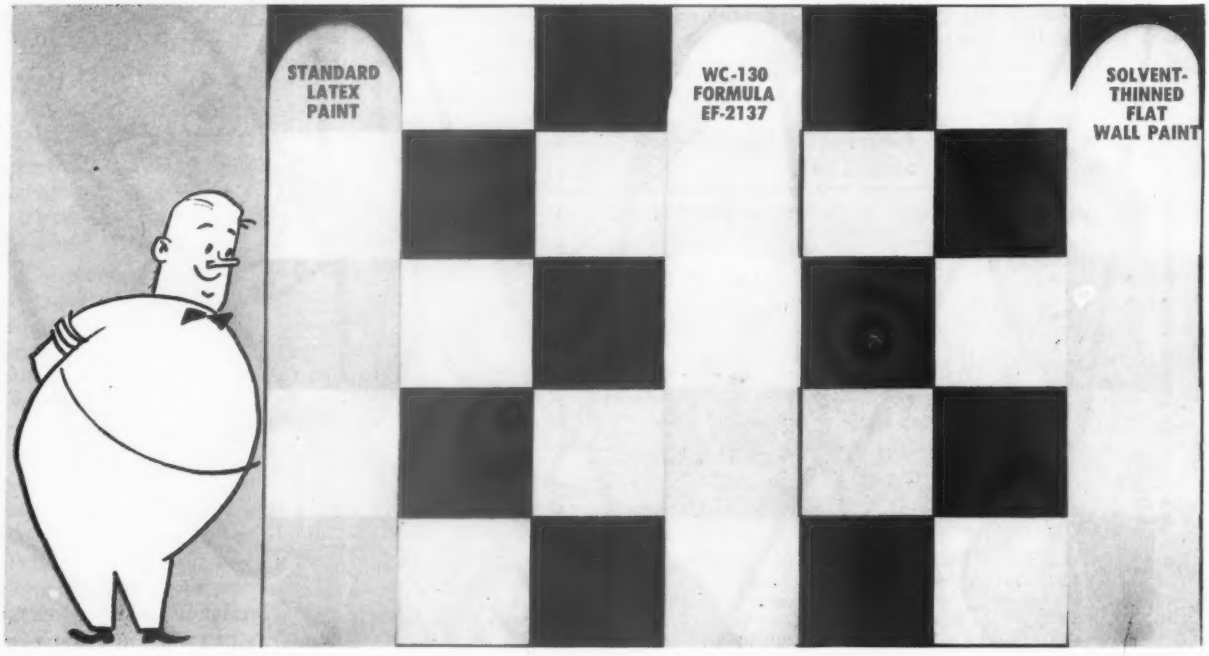
- ★ **Simplified Production**
- ★ **Less Foaming**
- ★ **Produces Sealers with Early Recoating Possibilities with Solvent- or Latex-Based Paints.**

Note this checkerboard test: The center panel is covered with WC-130 based paint. Hiding power is at least equivalent to that of a high-quality flat used over the right portion, and obviously much superior to a conventional latex-based paint used over the left portion.



# of BAKELITE WC-130 Latex

A TYPICAL FORMULATION FOR HIGH-QUALITY, LOW-COST PAINTS BASED ON "BAKELITE" LATEX WC-130

FORMULA NO. EF-2139

White Interior Wall Paint 69.8% PVC

Formula:	Lb.	Gal.	Wt. %
BAKELITE vinyl acetate resin latex WC-130 (58.5% N. V.)	121.59	13.07	10.37
Titanium dioxide pigment[1]	148.32	4.24	12.66
"Lorite" filler	341.65	16.15	29.15
Water	390.59	46.90	33.33
Ethylene glycol	13.82	1.49	1.18
"Tamol" 731 dispersant (25% solution)	19.90	2.16	1.70
Ammonium polyacrylate (15% N. V. solution)[2]	12.86	1.46	1.10
CARBITOL solvent	17.73	2.07	1.51
Butyl CARBITOL acetate solvent	17.73	2.17	1.51
Dibutyl phthalate plasticizer	7.11	0.81	0.61
CELLOSIZE hydroxyethyl cellulose thickener WP-300 (7.5% N. V. solution)	71.86	8.43	6.13
Rust Inhibitor[3]	2.92	0.34	0.25
Pine Oil	1.17	0.15	0.10
Wetting Agent (25% solution)[4]	4.66	0.56	0.40
Theoretical Yield	**1171.91**	**100.00**	**100.00**

1 Rutile, semi-chalking grade, TT-T-425 Type II.
2 For example, "Good-Rite" K-707.
3 For example, "Nox-Rust" #702.
4 For example, 25% aqueous dispersion "Aerosol" OT.

MANUFACTURING PROCEDURE:

Preparation of Pigment Paste: Charge 68% of the water to a pebble mill. Add the 25% "Tamol" 731 Solution and pine oil, mix well. Add the pigments and grind for 24 hours.

Preparation of the Paint: Add the various components to a paint mixer in the following order: Agitation should be continuous during each addition and each component should be dispersed before the next is added. Pigment paste, ammonium polyacrylate solution, ethylene glycol, WC-130 latex, dibutyl phthalate, CARBITOL solvent, Butyl CARBITOL acetate, rust inhibitor, wetting agent, balance of water, and CELLOSIZE WP-300 solution.

PROPERTIES: Viscosity—1220 cps. (Brookfield, 60 rpm, #4 spindle.) 70 Krebs units (150 gram weight).
Non-volatile—49.75%.
Pigment-volume ratio—69.8%.
Weight per gallon—11.7 lbs.
Freeze stability—Excellent—3 cycles, room temperature to —6° F.

RAW MATERIAL COST: Approximately $.93* per gallon. This can be reduced to approximately $.91 per gallon if CELLOSIZE thickener WP-300 solution is replaced with an equal weight of a 4% solution of CELLOSIZE hydroxyethyl cellulose thickener WP-4400.

This formula is for release only to coatings formulators. Based on Bakelite Company Laboratory results, it appears to offer merit in performance characteristics. However, because of the possible variations in the nature and quality of some of the ingredients used in this formula and in the condition under which they are produced, Bakelite Company is unable to guarantee like or optimum values for all coating properties and performance data.

Data and suggestions made in this publication are not to be construed as recommendations to use any product in violation of existing patents covering any material or its use.

*East of Rocky Mountains

Effect of Filming Aid Concentration on the Scrub Resistance of Interior Paints Based on BAKELITE Vinyl Acetate Resin Latex WC-130

Pigment-volume Concentration, %	30	37.8	40	45	50	60	70	70
Weight Ratio * Pigment/WC-130 Binder	1.42/1	1.81/1	1.94/1	2.36/1	2.68/1	3.8/1	5.6/1	5.6/1
Parts Filming Aid (Plast.—Solvents) per 100 parts tot. paint solids	7.9	6.8	6.5	5.7	5.15	6.5	4.7	7.3
Scrub Resistance**								
No. of Cycles	950	1400	2000	2000	400	2000	190	1700
% Rubbed Off	50	50	3	10	50	0	50	60

Stripping type failure—others failed by erosion

These test filming aid concn. vs. scrub resistance at constant pvc

*Binder calculated as WC-130 solids with 10% dibutyl phthalate added.
**Scrub resistance measured on coats brushed on primed Morest charts, using 5% "Ivory" soap solution.

INVESTIGATE THIS BUSINESS-BUILDING LATEX TODAY

BAKELITE BRAND RESINS for COATINGS

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The terms BAKELITE, CELLOSIZE, CARBITOL, and the Trefoil Symbol are registered trade-marks of UCC.

3,000 gallons

OF TRAFFIC PAINT PER 8-HOUR DAY

from this versatile **PATTERSON *Jet* MILL**

House Paints

Sash and Trim Paints

Latex Paints

Red Lead Primers

Architecturals and Industrials

Traffic Paints

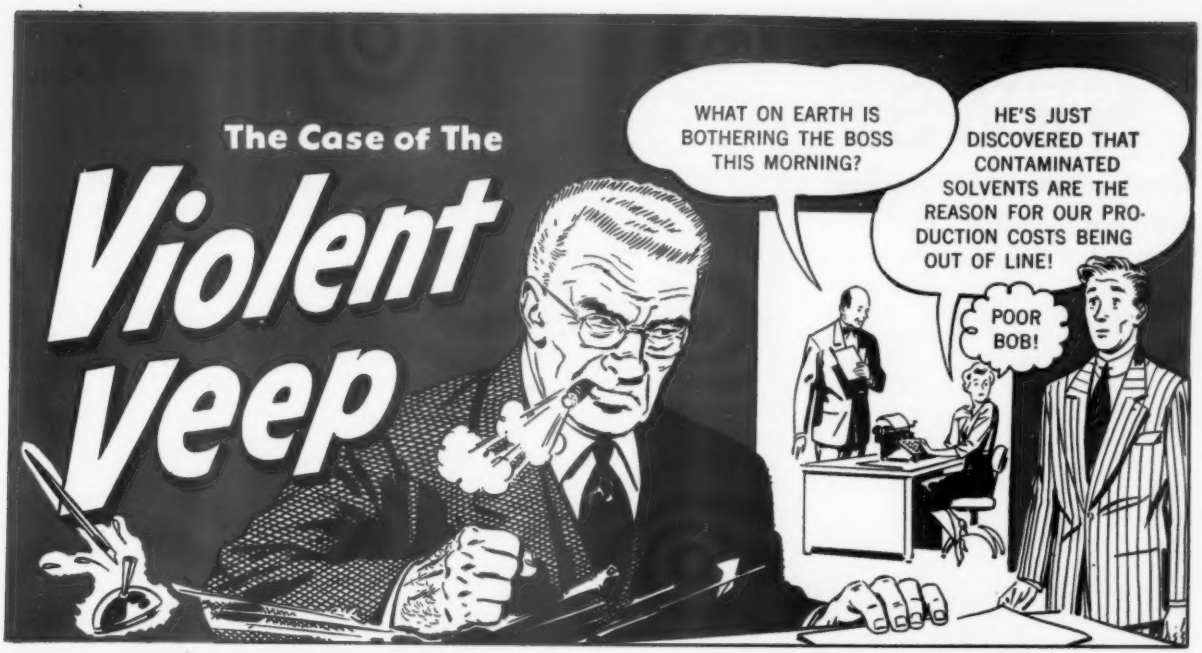
Resin Solutions

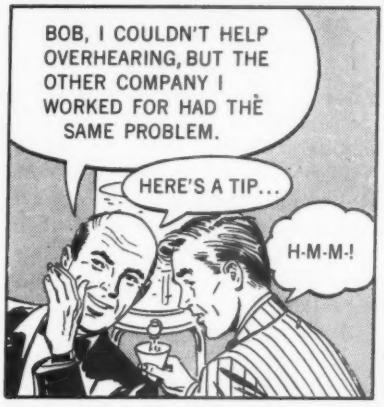
High volume production is assured when a Patterson Jet Mill is on the job. A typical example is the installation shown here in the plant of a West Coast paint manufacturer where the Jet Mill is used to process a wide variety of products including those listed above. Setting a new standard for high production rates, the Jet Mill has given months of trouble-free service. Versatility, ease of cleaning, high production rates and minimum floor space required are a few reasons why the Jet Mill is preferred.

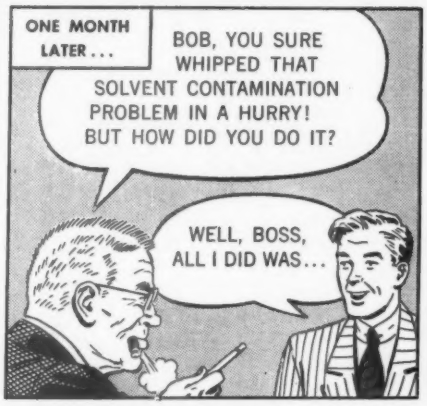
For high speed dissolving or dispersion of low viscosity vehicles, there is a Patterson Jet Mill to fit the production schedule of any plant. Write for details.

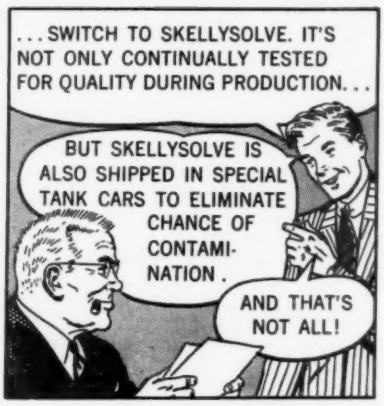
The Patterson Foundry and Machine Company
A Subsidiary of Ferro Corporation
East Liverpool, Ohio, U. S. A.
The Patterson Foundry and Machine Company, (Canada) Limited
Toronto, Canada

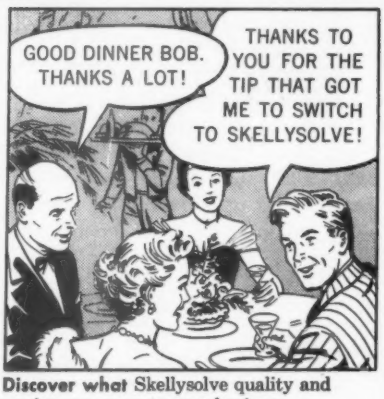
For the Paint and Varnish Industry: Grinding Mills . . . Linings and Grinding Media . . . Dispersers . . . Agitators and Mixers . . . Dissolvers . . . Synthetic Resin Systems.



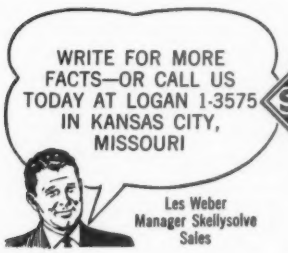








Discover what Skellysolve quality and service can mean to *your* business.



SKELLY **Skellysolve**

SKELLY OIL COMPANY

Industrial Division

605 West 47th Street, Kansas City 41, Mo.

Skellysolve for Paint, Varnish and Lacquer Manufacture

SKELLYSOLVE-L. A quick-evaporating lacquer diluent of exceptionally sweet odor and freedom from heavy, greasy compounds. Closed cup flash point about 12°F.

SKELLYSOLVE-S. Low end point mineral spirits for thinning paints, varnishes, polishes and the like, insuring quick initial dry with medium final dry. Closed cup flash point about 103°F.

SKELLYSOLVE-S2. A quick evaporating mineral spirits. Closed cup flash point about 101°F. Recommended for industrial paints. Excellent for manufacturing polishes and waxes.

SKELLYSOLVE-V. For general use—thinning paints, varnishes and polishes. Quick evaporating, narrow range, insuring quick initial dry with fast final dry. Closed cup flash point about 50°F.

SKELLYSOLVE-T. High initial boiling point mineral spirits with minimum of heavy compounds, insuring slow initial dry with medium final dry. Closed cup flash point about 140°F.

Ask about our new Skelly Petroleum Insoluble Grease.

NEWS

Gold Dipping Lacquer Simulates Brass Finish

An inexpensive way to simulate brass plating through the use of a tough, gold dipping lacquer has now been achieved in the highly competitive, low-price metal furniture industry. The method was developed through the cooperative effort of Dodson Industries, Inc., Kansas City, Mo., working with the Sewall Paint & Varnish Co., also of Kansas City.

End brackets for a television table have been dipped in gold pigmented butyrate lacquer to give them a brass finish effect.

When competitive merchandising in the metal furniture field added such design features as brass plated components on metal stands, Dodson designers decided to search for a less expensive but thoroughly adequate substitute that would accomplish the same effect. The problem as posed by Dodson was ultimately solved by the Sewall laboratories, which utilized half-second butyrate furnished by Eastman Chemical Products, Inc., Kingsport, Tenn., subsidiary of Eastman Kodak Co.

Half-second butyrate lacquer can be metal pigmented and possesses an unlimited pot life. Any dipping operation employing this lacquer can be maintained continually or halted at whatever intervals are desirable, merely keeping the lacquer container filled as needed from day to day.

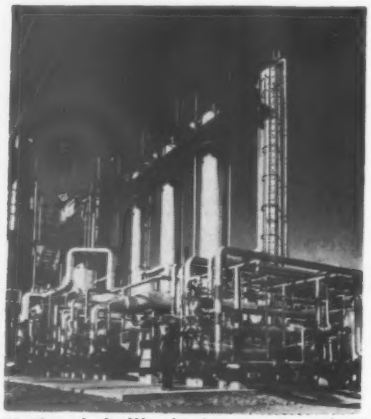
Perfect blending of the pigment and the vehicle in the lacquer to provide adequate hiding and draining on metal surfaces is achieved through agitation of the lacquer solution in a drum. A slow rotary mixer actuated by an electric motor keeps the solution constantly agitated throughout the dipping procedure.

•

National Aniline Starts New Isocyanates Plant

Start-up of a new multi-million dollar plant to produce organic isocyanates has been announced by Donald G. Rogers, President, National Aniline Division, Allied Chemical & Dye Corp.

The new plant, constructed in record time, occupies over 15 acres on National Aniline's 210 acre plant site just south of Moundsville, W. Va. Louis C. Goode, recently appointed plant manager of National's Moundsville plant, will be in charge of the isocyanates unit.



National Aniline's isocyanate plant at Moundsville, W. Va.

National's newest isocyanate facility is a completely integrated operation, with all chemical raw materials supplied within the Allied Chemical group. Its basic position is enhanced by the employment of technology developed during many years of dyestuff production using the same intermediates.

Under the tradename "Nacconates," National Aniline has produced isocyanates in substantial volume in its interim plant at Buffalo since early in 1955. It was announced that the Buffalo plant would continue to produce new isocyanates, as a supplement to the output from the Moundsville facility.

Navy May Get Directive To Buy Commercial Paint

The U. S. Navy, which manufactures two million gallons of its own marine paint annually, may soon be ordered out of the paint business, according to reliable sources. Reports are that if the Defense Department can justify the discontinuance of military paint manufacture to Congress on a cost basis, an order to effect stoppage will be issued.

Present estimates indicate that military competition in the marine paint field amounts to 20 per cent of all United States production. The Navy, by itself, manufactures 33 varieties at factories in Norfolk, Va., and Mare Island, Calif. These paints include four primers, five shipbottom paints, 14 vinyls, three tank paints and seven topside exterior paints.

•

Heyden Acquires Newport

Stockholders of Heyden Chemical Corp. and Newport Industries, Inc., at special meetings on December 27, approved by more than two-thirds vote a plan for the acquisition of the assets of Newport by Heyden in exchange for Heyden common stock and the assumption by Heyden of all of Newport's liabilities.

Announcement of this decisive action was made jointly by Simon Askin, president of Heyden, and Armin A. Schlesinger, chairman of the board of Newport. Earlier the boards of directors of both companies had also approved the venture.

It was stated by the company heads that the closing of the transaction was expected to be held January 2. At that time the name of the combined companies was to be changed to "Heyden Newport Chemical Corp."

•

Celanese Builds Plant

Celanese Corporation of America has begun construction of a new acrylate ester plant in Pampa, Tex., according to R. W. KixMiller, Vice President and General Manager, Celanese Chemical Division.

When completed, the new plant is expected to have a capacity of 15 million pounds of acrylic acid esters per year. Production is scheduled to start during the last quarter of 1957.

NEWS

Thibaut & Walker Appoints

The J. W. Van Tuin Co., Chicago, has been appointed exclusive sales agent in its area for a line of alkyds, varnishes and dispersions manufactured by The Thibaut & Walker Co., Inc., Newark, N. J.

(L to R) J. W. Van Tuin and W. G. Parker, President of The Thibaut & Walker Co., conclude agreement.

Mr. Van Tuin, who heads the sales company, is equipped with a rich background in the coatings industry. Before starting his own business in 1953, he served for four years with the Sherwin-Williams Co. and for 13 years with the Nuodex Products Co.

•

New Diamonite Agents

Continuing expansion of its field sales organization, Diamonite Products Manufacturing Co., Canton, Ohio, has announced appointment of three new sales representatives for its high density cylindrical grinding media.

M. J. Daly Co., Ludlow, Ky., will act as representative for Diamonite grinding media in Southwestern Ohio, Southern Indiana and all of the state of Kentucky.

In Nebraska, Kansas, Oklahoma, and western Missouri, grinding media sales will be handled by Abner Hauck Chemical Co., Kansas City, Mo.

Charles A. Wagner Co., Philadelphia, Pa., will handle sales in southern New Jersey, all of Maryland, Delaware and District of Columbia, and in eastern Pennsylvania.

Fire Retardant Paints Study Released By Army

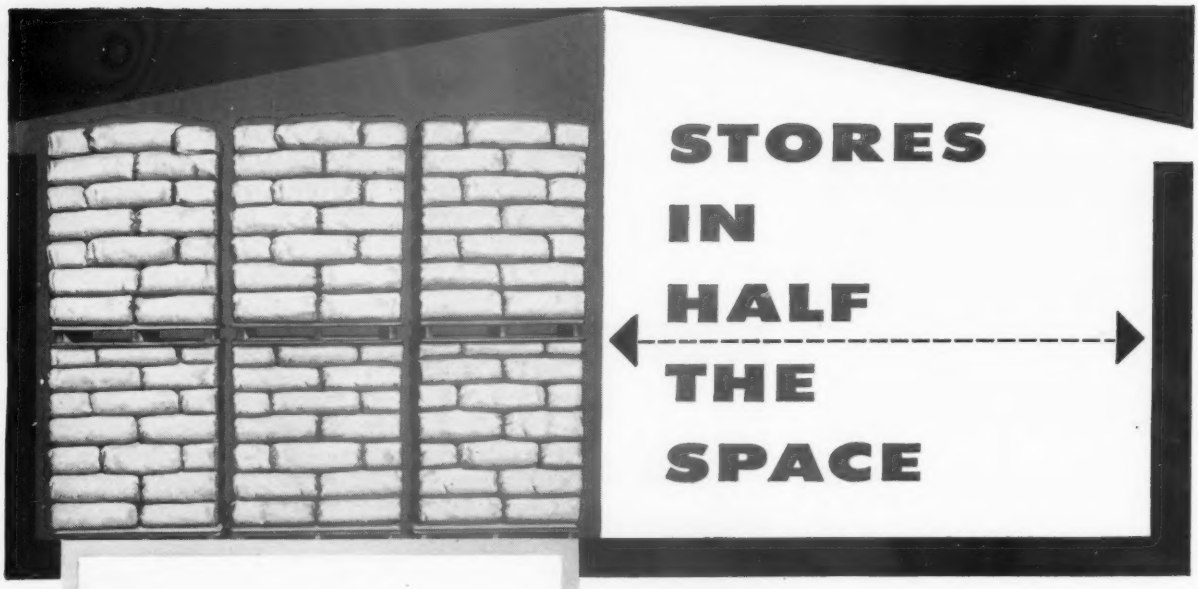
Paints with pigments of zinc borate and vehicles of alkyd combinations had the best fire retardancy characteristics of 30 commercial formulations tested in 1952 by the Army Engineers. Previously under security classification, the report of this research has just been released through the Office of Technical Services, U. S. Department of Commerce.

In the same study 12 agents evaluated for their intumescent effects in exterior paint formulations showed that isano oil combined with a polyamide resin gave the best results. Outstanding fire retardancy is not obtained without some degree of intumescence. Climate exposure and burning tests were run on both wood and fibrous wallboard surfaces.

Other evaluations, by the New York cabinet test method, showed that pigment concentrations definitely affect the fire retardant properties of paint films; durability and fire retardancy of the paints vary with types of field exposures; calcium carbonate has good fire retardant properties, especially in the limitation of the char area; and water soluble intumescent agents are fairly resistant to leaching when protected by a well-formulated oil paint.

AZODOX

New, Higher Density Zinc Oxide



HERE ARE OTHER IMPORTANT REASONS WHY AZODOX IS BEST FOR YOU

Increased Mixing Capacity. AZODOX incorporates readily in oil, disperses completely. Its high density, low bulk gives greater capacity, steps up production in both mixers and mills.

Physical Properties Unchanged Except for Density. Consistency, particle size and shape, color and all other physical properties of AZO-ZZZ, American Process, paint grade zinc oxides are unaltered. *Apparent density only is changed.* All chemical properties are unchanged.

Flows More Freely, Less Dusting than conventional zinc oxides.

AZODOX Cuts Your Costs. Faster handling, easier storing, quicker mixing save you money.

Samples and test-lots of factory-proved AZODOX now available for you *at the same price of conventional zinc oxides.*

AZODOX is a revolutionary new form of zinc oxide (de-aerated). With twice the density, half the bulk of conventional oxides, AZODOX is the answer to your storage problem. AZODOX comes to you in an easy-to-handle small package, shaped to permit closely packed, unitized shipments. *And the perfect texture of the material remains unchanged.*

AZODOX is available in all grades of American process lead-free zinc oxide.

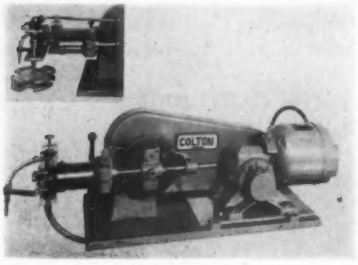
American Zinc sales company

Distributors for
AMERICAN ZINC, LEAD & SMELTING COMPANY
COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.



COLTON

LIQUID FILLERS
High-Speed Type

New "Little Giant" single and twin-nozzle models have been added to the Colton "100 Series" line of liquid fillers. These models are claimed to make available for the first time features of high-speed, volumetric filling in a low-cost, compact, bench-type machine.

Multiple liquid fillers are equipped with patented metering cylinder and valve assembly, which includes an adjustable suck-back control. The control is said to permit high-speed volumetric filling to accuracies within less than one percent variation.

Among materials that can be handled by the new filler are paints and related oil products. Arthur Colton Co., Dept. PVP, 3400 East Lafayette, Detroit 7, Mich.

HIGH-CAPACITY V-BELT
For Multi-Belt Installations

The new "Powerflex Hi-Capacity V-belt" is reported to have a strength of 40 per cent more than that of standard belts. It is thus claimed to reduce belt failure on multi-V-belt installations to a minimum and to lower drive costs, since fewer belts and narrower sheaves are required.

Featuring a special oil resistant cover to prolong its life, the new belt can also be furnished with static conducting covers. A and B section belts are manufactured with nylon laminated construction. D and E sections are of heavy rayon grommet construction. Thermoid Co., Dept. PVP, 200 Whitehead Rd., Trenton, N. J.

HOT PLATE
With Magnetic Stirrer

The "Fisher Thermix," a new double-duty laboratory apparatus, combines a 700-watt heater and magnetic stirrer for a host of routine stirring, mixing and dissolving operations. A continuously variable bi-metallic thermostat for top-plate heating control is employed.

FISHER

In the "Thermix," the stirrer motor is insulated from the ceramic-supported hot-plate with what is described as "an air-aluminum-asbestos-aluminum-air heat barrier." Furthermore, a Fiberglas extension keeps heat from travelling along the motor shaft.

Manufacturer reports that copper-jacketed heating elements are cast directly into the aluminum top-plate. Hot-plate and stirrer are designed to operate either independently or simultaneously. Fisher Scientific Co., Dept. PVP, 717 Forbes St., Pittsburgh 19, Pa.

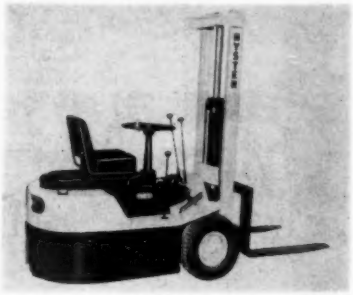
ALIPHATIC AMINES
Long Chain Type

"Armeens O and OD," two new long chain amines, are reported to be highly unsaturated. According to the manufacturer, because of this high unsaturation, the cationic chemicals have a low solidification point and excellent solubility in almost all common organic solvents except the glycols.

Both new amines are produced in easy to handle liquid form, for use in corrosion inhibition, quaternary production, adhesion improvers, and chemical intermediates. Chemical Division, Armour and Company, Dept. PVP, 1355 W. 31 St., Chicago, Ill.

LIFT TRUCK
2,000 lbs. Capacity

The new "Hyster 20 Lift Truck, Model QC," with optional job attachments and LP-Gas installations, is designed to lift a 2,000 lbs. capacity. The lift truck comes equipped with pneumatic tires. One of the special job attachments for use with the "Hyster 20" is a "Load-Grab" clamp, to permit the handling of loads by hydraulically actuated arms, which grip difficult to handle objects from the side.



HYSTER

Manufacturer states that the LP-Gas equipment on the truck is UL approved. The LP-Gas operation is said to give increased engine life, longer oil and oil filter life, lower fuel costs and reduction of exhaust fumes. Hyster Co., Dept. PVP, 2902 N.E. Clackamas St., Portland 8, Ore.

NEW MATERIALS — EQUIPMENT

EPOXY COMPOUNDS
For Use As Intermediates

Two new epoxy compounds, dipentene monoxide and alpha-pinene oxide, are now available in experimental quantities. Both are suggested for use as intermediates in the manufacture of protective coatings, adhesives and plasticizers; as reactants in organic synthesis, and as solvents.

Dipentene monoxide is said to combine the reactivity of any epoxy group with that of an olefinic double bond in a cyclic terpene molecule. Alpha-pinene oxide is claimed to combine the reactivity of an epoxy group with that of the bicyclic system of alpha-pinene.

In the presence of a trace of acid, alpha-pinene oxide rearranges in aqueous media to give mainly sobrerol, while under anhydrous conditions campholenic aldehyde is the main product. Becco Chemical Division, Food Machinery and Chemical Corp., Dept. PVP, Buffalo, N. Y.

P-BASE MOTORS
For Vertical Pumping

A new line of protected, vertical, solid shaft, P-base motors for all vertical pump installations has been introduced. The new motors, with normal thrust bearings in all sizes from 1 to 40 horsepower and high thrust in sizes from 1 to 15 horsepower, are available in protected, totally-enclosed, or explosion-proof enclosures.

According to the manufacturer, all of the new P-base motors are corrosion-proof for long, safe operation under adverse conditions as are frequently found in the process industries. Company states that the standard enclosure for its explosion-proof, P-base motors meets Underwriters' Laboratories specifications. Reliance Electric and Engineering Co., Dept. PVP, 1088 Ivanhoe Rd., Cleveland 10, Ohio.

FILTER CARTRIDGE
Made of White Cellulose

A new 5-micron filter cartridge made of white cellulose, bonded with a totally inert resin, has been introduced. Called "White Micro-Klean," the cartridge is recommended for filtration problems where fluid polishing to extreme clarity is required with no contamination of fluid.

The new cartridge fits most standard filter housings wherein string-wound cotton filters have generally been employed. Successful applications of the new filter, thus far, include filtration of fine enamels, clear lacquers, wax, and methanol. The Cuno Engineering Corp., Dept. PVP, Meriden, Conn.

VISCOMETER RECORDERS
New Model Series

Company announces a new line of viscometer recorders called the "Model R3 Series." "Model R30" is for recording only, while Models "R31," "R32" and "R33" contain one, two or three adjustable switch points respectively.

The last three units will take care of all electric on-off two-position and three-position control, operating motors, motor starters or solenoid valves. These models can also be used for alarms and signals of all types.

The series also includes "Model R3P," providing a 3-15 lb. output air pressure which is a function of viscosity. This model can be used with other pneumatic equipment to provide automatic control. Norcross Corp., Dept. PVP, 247 Newtonville Ave., Newton 58, Mass.

LYTRON* 680 is for both!

NEW AND UNIQUE LATEX BINDER IS BASIS FOR BOTH EXTERIOR AND INTERIOR PAINTS

superior in: weatherability and durability . . . early moisture resistance . . . resistance to chalking and blistering . . . flexibility . . . low temperature fusion . . . ease of application on masonry or previously painted wood . . . resistance to alkalinity.

Lytron 680 is now in full-scale production—available for immediate shipment in tank car quantities. Write for prices, complete technical data, and evaluation samples, to Monsanto Chemical Company, Plastics Division, Room 1821 Springfield 2, Mass.

Where creative chemistry works wonders for you

MONSANTO

LYTRON: REG. U. S. PAT. OFF.

...SINCLAIR CHEMICALS ALWAYS RIDE FIRST-CLASS!

Two special fleets of tank cars are added assurance that you get what you pay for when you specify Sinclair! To guard against contamination, Sinclair ships odorless solvents and aromatics in separate tank car fleets used exclusively for this purpose. It saves trouble!

TRULY ODORLESS SOLVENTS – Sinclair's team of truly Odorless Solvents, both Light (340-405° F.) and Heavy (375-465° F.), are synthetically produced from carefully selected hydrocarbons to insure the uniformity, stability and superior quality required by manufacturers of odorless paints. Available in full, or split tank car quantities.

HIGH PURITY AROMATICS – Toluol (1° nitration grade), Xylol (5°), and Paraxylene (98%) are being produced by modern Udex extraction facilities at Sinclair's Marcus Hook, Pa., refinery. Available in full, or split tank car quantities.

When your manufacturing processes call for fast and reliable service, and top quality in petroleum-derived chemicals, Sinclair Chemicals, Inc. is ready to serve you. For complete information call or write to:

SINCLAIR CHEMICALS, INC.

(Affiliate of Sinclair Refining Company)

600 Fifth Avenue, New York 20, N. Y. • Phone: Circle 6-3600
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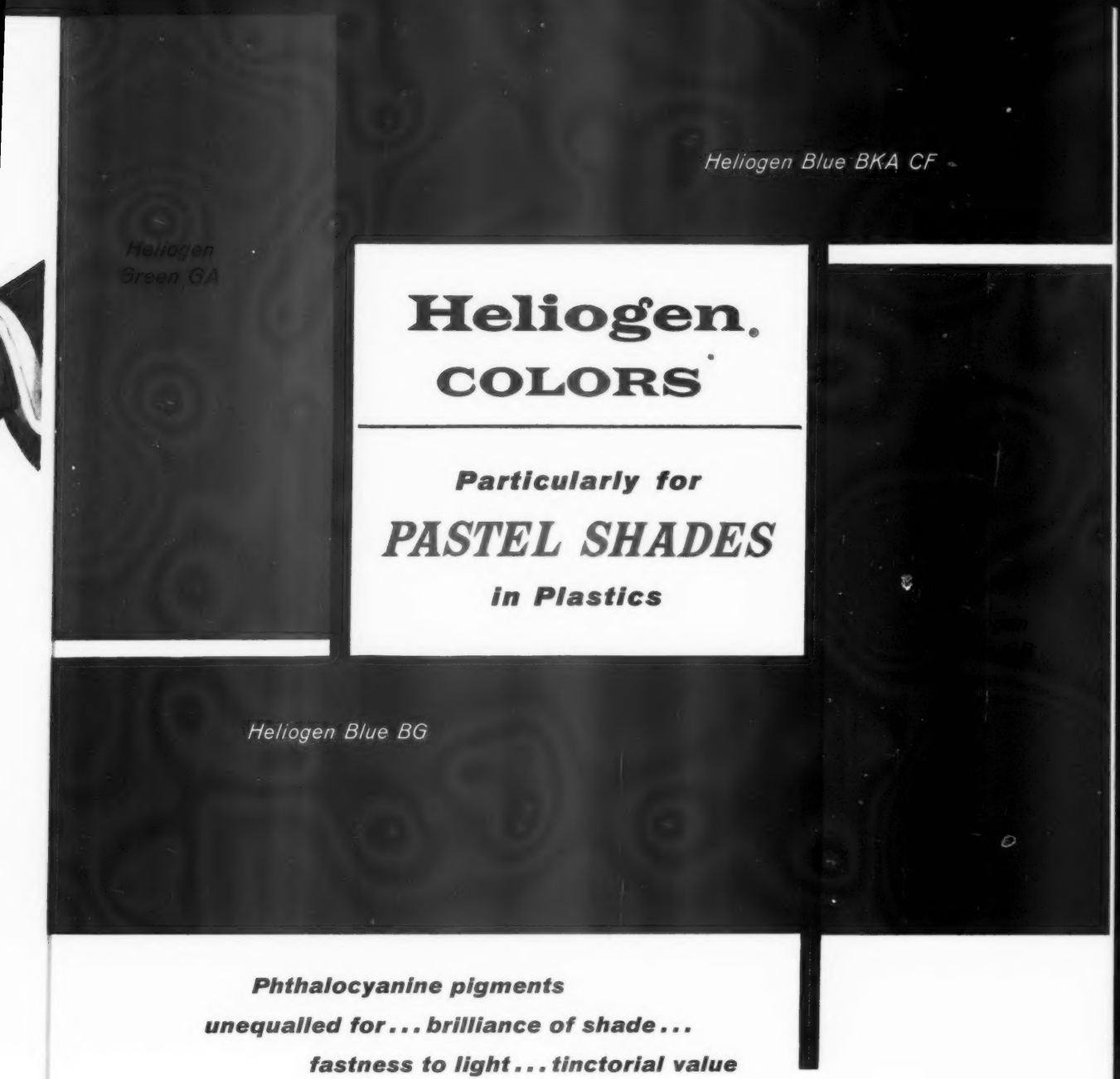

Heliogen. COLORS

Particularly for

PASTEL SHADES

in Plastics

Phthalocyanine pigments

unequalled for... brilliance of shade...

fastness to light... tinctorial value

Heliogen Colors are supplied in powder or presscake form—according to the user's requirements. Compounders of plastics—and particularly the Vinyl plastics—standardize on these colors for their ease of handling, their chemical stability and their brilliance. (This page was printed with inks made from the Heliogen Colors as indicated.)

The powders are noted for ease of grinding. The corresponding presscakes flush readily into the plasticizers normally used. All are non-crystallizing in the presence of aromatic solvents—with the exception of Heliogen Blue BKA Powder CF. All are relatively heat stable—particularly the Heliogen Blue BG Powder which is outstanding in this respect.

To help you meet your particular requirements as to qualities, method and ease of application, let us send you our free new specifications booklet on Heliogen Colors—or call on the services of our Technical Department. Please address your inquiry to Department 49.

From Research to Reality

gde gaf

GENERAL DYESTUFF COMPANY

A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION

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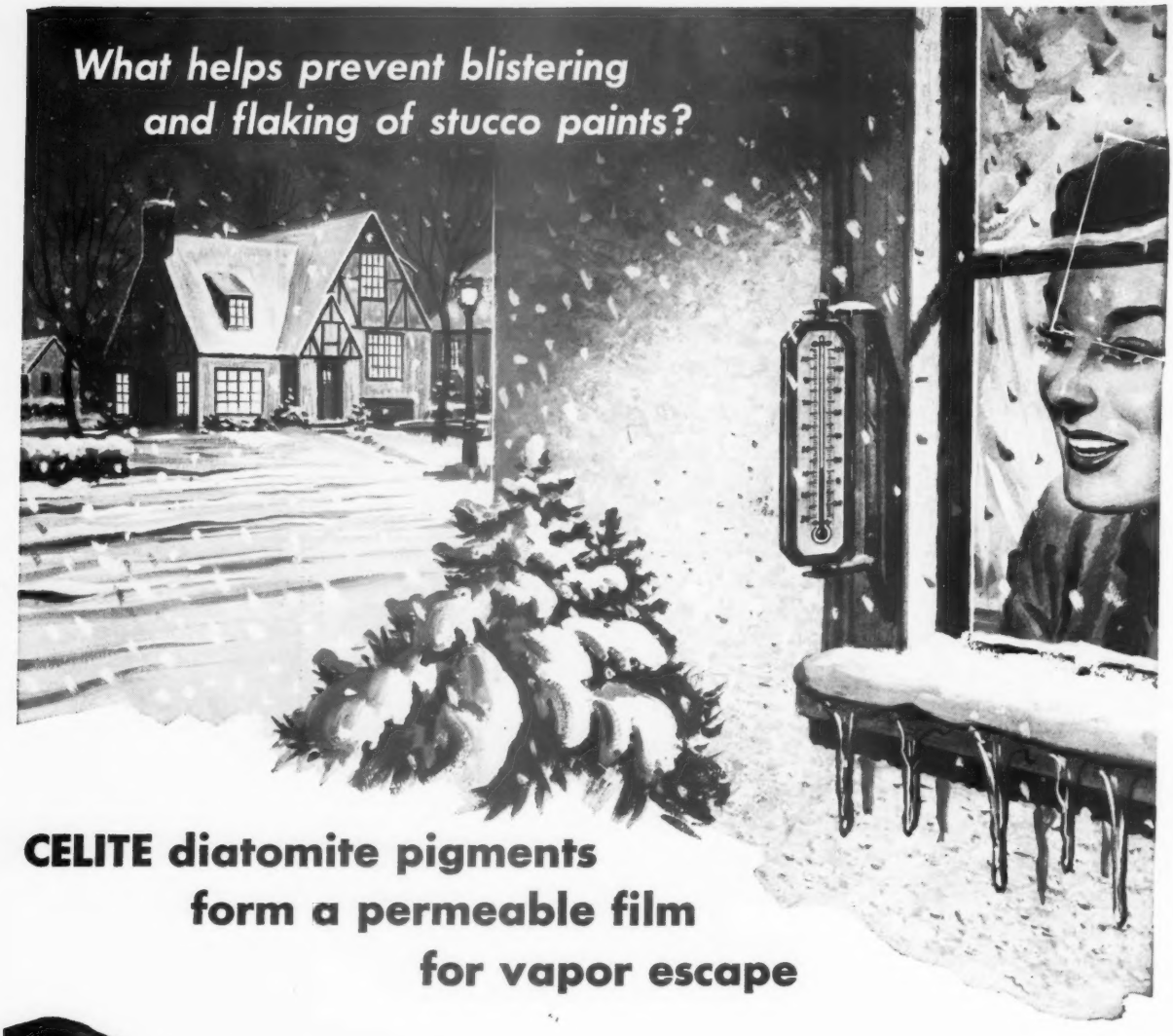
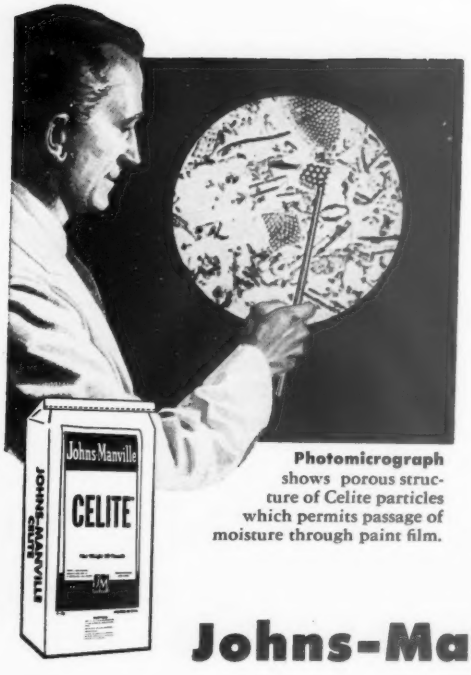
IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA, LTD. MONTREAL



CELITE diatomite pigments form a permeable film for vapor escape



Photomicrograph shows porous structure of Celite particles which permits passage of moisture through paint film.

COLD WEATHER spells trouble for stucco paint. For the colder it gets the greater the vapor pressure due to the temperature differential. When paint resists this pressure, serious blistering and flaking result. But when Celite* is present in the formulation, the moisture passes through a vapor-permeable film formed by the microscopic particles. Yet this same film will resist the penetration of exterior moisture.

Celite helps paint withstand the assaults of severe weather on the outside, too. Its hard, tough, silica composition provides extra strength and durability. And the flexible interlacing structure of the particles readily permits the film to expand and contract with temperature changes.

Celite also helps when the paint is applied. Its porosity shortens drying time and its superior dry hiding power provides excellent coverage . . . frequently at the saving of prime pigment. Find out more about these extender pigments. Write today to Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

JOHNS MANVILLE JM PRODUCTS

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

Johns-Manville CELITE THE EXTENDER PIGMENTS FOR ALL COATINGS

PERSONNEL CHANGES

INLAND STEEL CONTAINER

Richard J. Nelson has been selected to fill the company's newly created post of assistant to the vice president in charge of operations. Mr. Nelson was moved to the Container company from the parent organization, Inland Steel Co., where he was assistant manager of industrial relations.

R. J. Nelson

In his new position, Mr. Nelson will be responsible for the company's central purchases, industrial and trade relations, and for special assignments.

Inland Steel Container Co. has also announced the promotion of **Leonard M. Ansley,** formerly director of purchases, to plant manager of the company's Cleveland plant.

REYNOLDS METALS

Raymond H. Frederick has been named technical sales representative for aluminum powder and paste products by Reynolds Metals Co. He will have his headquarters at the aluminum firm's office in Kansas City, Mo., and will cover the south central states in the territory served by Thompson-Hayward Chemical Co., Reynolds distributor for powder and paste products.

R. Frederick

Mr. Frederick was transferred to Kansas City from the Reynolds sales headquarters in Louisville, Ky. Since 1955, he had been assistant product supervisor for aluminum powders and pastes. He joined Reynolds in 1952.

ARMOUR

Werner L. Riegler has been appointed product manager of the fatty acid sales department of the Chemical Division of Armour and Company.

Mr. Riegler, formerly assistant manager of fatty acid sales, started with Armour in 1951 in the application research department. Prior to joining Armour, he was sales consultant for protective coatings.

ENTERPRISE PAINT

J. H. Lawson has announced the election of **Arnold R. Wolff** to succeed him as president of Enterprise Paint Manufacturing Co. Mr. Lawson has, meanwhile, assumed the newly-created post of vice-chairman of the Board of Directors.

A former executive vice president, Mr. Wolff joined Enterprise in 1945 and has worked in all divisions of the company, including Magicolor Co. He is, in addition, a member of the executive committee of the Chicago Paint, Varnish and Lacquer Association.

Elsewhere in the Enterprise Paint Manufacturing Co., the election of **Leonard S. Vincent** to the newly-created post of Vice President in Charge of Trade Sales has been announced. Together with the previous election of **G. P. Hall** as Vice President in Charge of Trade Sales Merchandising, this appointment is part of a program designed to increase strength at the dealer and distributor level.

Mr. Vincent has been with Enterprise since 1947 and has served the company in the Trade Sales Division as salesman and sales supervisor both in the East and in the Chicago area. He was promoted to Trade Sales Manager in 1955, his last previous position.

SHAWINIGAN RESINS

James J. Manning has joined the company's Chicago sales office and **Thomas Gill** has been assigned to the New York headquarters.

Both men were recent participants in an extensive sales training program at Shawinigan's main plant and research laboratories in Springfield, Mass.

DU PONT

George H. Baldwin, Dallas regional sales manager, has been appointed manager of a new trade sales organization which was set up by Du Pont. The new appointment is in line with a large-scale reorganization, effective January 1, which established new trade, industrial, and automotive refinish sales sections at the Du Pont headquarters in Wilmington, Del.

Assisting Mr. Baldwin will be **Charles P. Culp** as eastern manager and **Charles W. Dingle, Jr.,** as western manager. Mr. Culp previously was Atlanta regional sales manager, while Mr. Dingle served as Dallas regional trade sales manager. **Donald V. Bauder,** who was trade sales manager (staff) in Wilmington, now becomes trade sales marketing manager.

In other appointments in the new trade sales organization, **William D. Lawson,** manager of the Finishes Sales Development Laboratory in Philadelphia, will become manager of industrial maintenance sales in Wilmington, and **John D. Rode,** assistant trade sales manager (staff), will become product manager for industrial maintenance sales.

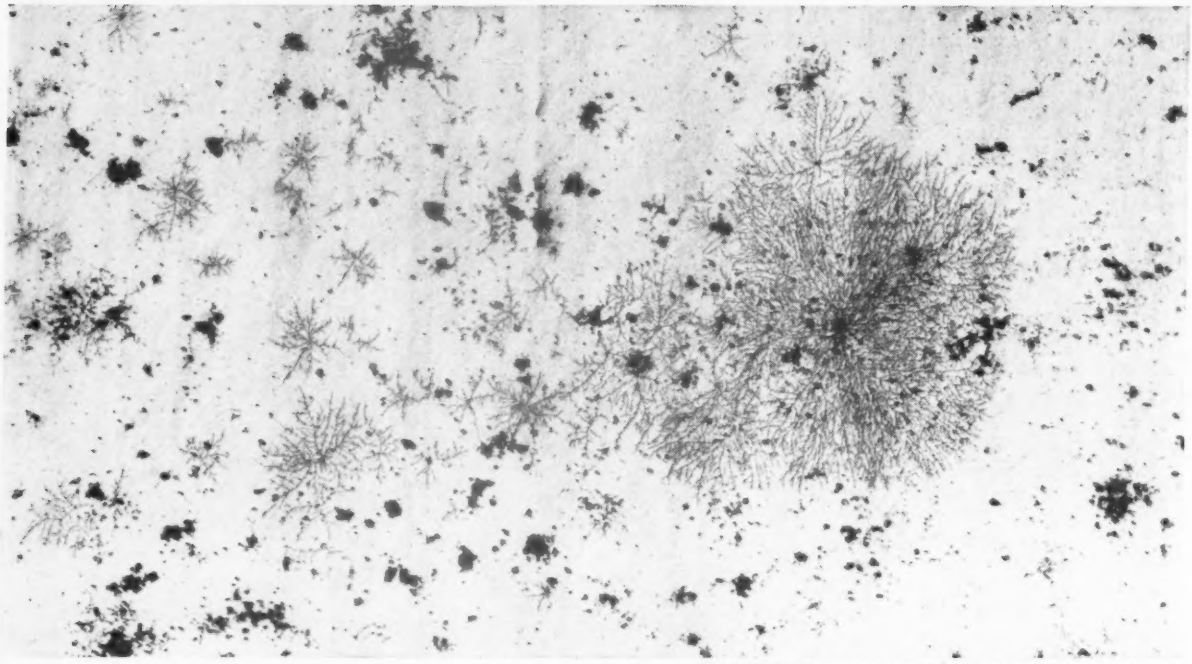
Harold E. Goldsmith, Chicago regional sales manager, will become manager of a new industrial sales group, with **Walter S. Woods, 2nd,** as eastern manager and **Richard N. Sanger** as western manager. Mr. Woods formerly was industrial sales manager (staff) in Wilmington, and Mr. Sanger was previously Cleveland regional sales manager. **William P. Fisher, Jr.,** who was industrial sales manager (staff) in Wilmington, becomes industrial sales marketing and product manager.

George H. Berlin, Jr., Kansas City regional sales manager will be manager of a new refinish sales organization, assisted by **George A. Massih** as eastern manager and **Robert R. Allen** as western manager. Mr. Massih was Boston regional refinish sales manager, while Mr. Allen was refinish sales manager (staff) in Wilmington.

Other appointments are as follows:

John H. Stutt, Philadelphia regional sales manager, has been named staff assistant to the director of sales in Wilmington, and **Hanson H. Hodge,** Cleveland regional refinish sales manager, will become assistant manager of sales services in Wilmington. **Robert R. Atkinson** will succeed Mr. Dingle as Dallas regional trade sales manager; **Ernest W. Rowe** will succeed Mr. Massih as Boston regional refinish sales manager; and **Robert H. Melka** will succeed Mr. Hodge as Cleveland regional refinish sales manager.

David E. Goldich, Boston regional sales manager, will retire this month after 31 years with Du Pont.



TEN DIAMETER PHOTOGRAPH OF MILDEW AT NEW ORLEANS TEST SITE

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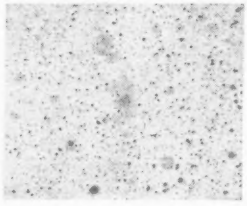
EAGLE-PICHER
Leaded Zinc Oxide

WITH EAGLE-PICHER LEADED ZINC OXIDE in your house paint formulation, you can provide improved resistance to mildew. Yes, scientific tests prove that house paints formulated with Eagle-Picher Leaded Zinc Oxide not only resist mildew discoloration but offer far superior decorative value and longer life at low cost.

HERE'S PROOF OF MILDEW RESISTANCE IN HOUSE PAINTS!

Tests made at Eagle-Picher Test Farm, New Orleans, La.



Mildew discoloration after 5 months vertical south exposure, without Eagle-Picher Leaded Zinc Oxide. (No fungicide used.)

No mildew after 5 months vertical south exposure, with paint* made from Eagle-Picher Leaded Zinc Oxide. (No fungicide used.)

***Formulation of Leaded Zinc Oxide Paint Used in Test**

Pigment—62.2%		Vehicle—37.8%	
E-P #356 Leaded ZnO	50.0%	Raw Linseed Oil	60.5%
TiO_2—Anatase	15.0	Z-3 Linseed Oil	19.5
Magnesium Silicate	35.0	Mineral Spirits	18.2
	100.0%	24% Pb	1.3
		6% Co	.5
			100.0%

PVC—32.0%

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General Offices: Cincinnati 1, Ohio

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J. P. Haworth

H. C. Evans

ENJAY

J. P. Haworth has been appointed manager of the newly-established Eastern Sales Division for the Enjay Company, Inc. At the same time, **H. C. Evans,** who opened the company's Akron offices in 1955, has been designated Akron District manager.

Mr. Haworth will be responsible for the operations of the company's field sales personnel in a 19-state area, including New England, the Eastern Seaboard states, West Virginia, Ohio and Michigan. He joined Enjay early in 1955, after 15 years with the Esso Research and Engineering Co., and most recently has been assistant sales manager of Enjay's Butyl Division.

Mr. Evans, who will report to Mr. Haworth, will be responsible for Enjay sales activities in Ohio and adjacent territories in Michigan, western New York, western Pennsylvania and West Virginia. Mr. Evans joined Enjay in 1947, and previously had worked in the chemical-products operations of Esso Standard Oil Co. at the company's Bayway and Baton Rouge refineries.

In other recent personnel moves, Enjay named **W. H. Peterson** as Butyl Division sales manager; **P. C. Richards** as sales manager of the Alcohols and Chemicals Division, and **K. J. Nelson** as manager of a new Special Accounts Division.

Mr. Richards and Mr. Nelson were assistant sales managers in Enjay's Alcohol and Chemicals Division. Mr. Peterson was assistant sales manager of the Butyl Division, and formerly was Enjay's district manager at Chicago.

SHAWINIGAN RESINS

Irving Serlin has joined the research department of Shawinigan Resins Corp. Formerly an associate scientist with Brookhaven National Laboratories, Dr. Serlin will now conduct fundamental research on Shawinigan's acetal resins, Formvar, polyvinyl formal, and Butvar, polyvinyl butyral.

A native of New York, Dr. Serlin received his B.S. degree in Organic Chemistry in 1943 from the City College of New York. He received his M.S. and Ph.D. degrees in Organic Chemistry from Columbia University in 1947 and 1950 respectively.

BARRETT

Five appointments in the Research and Development Department of the Barrett Division, Allied Chemical & Dye Corp., have been announced.

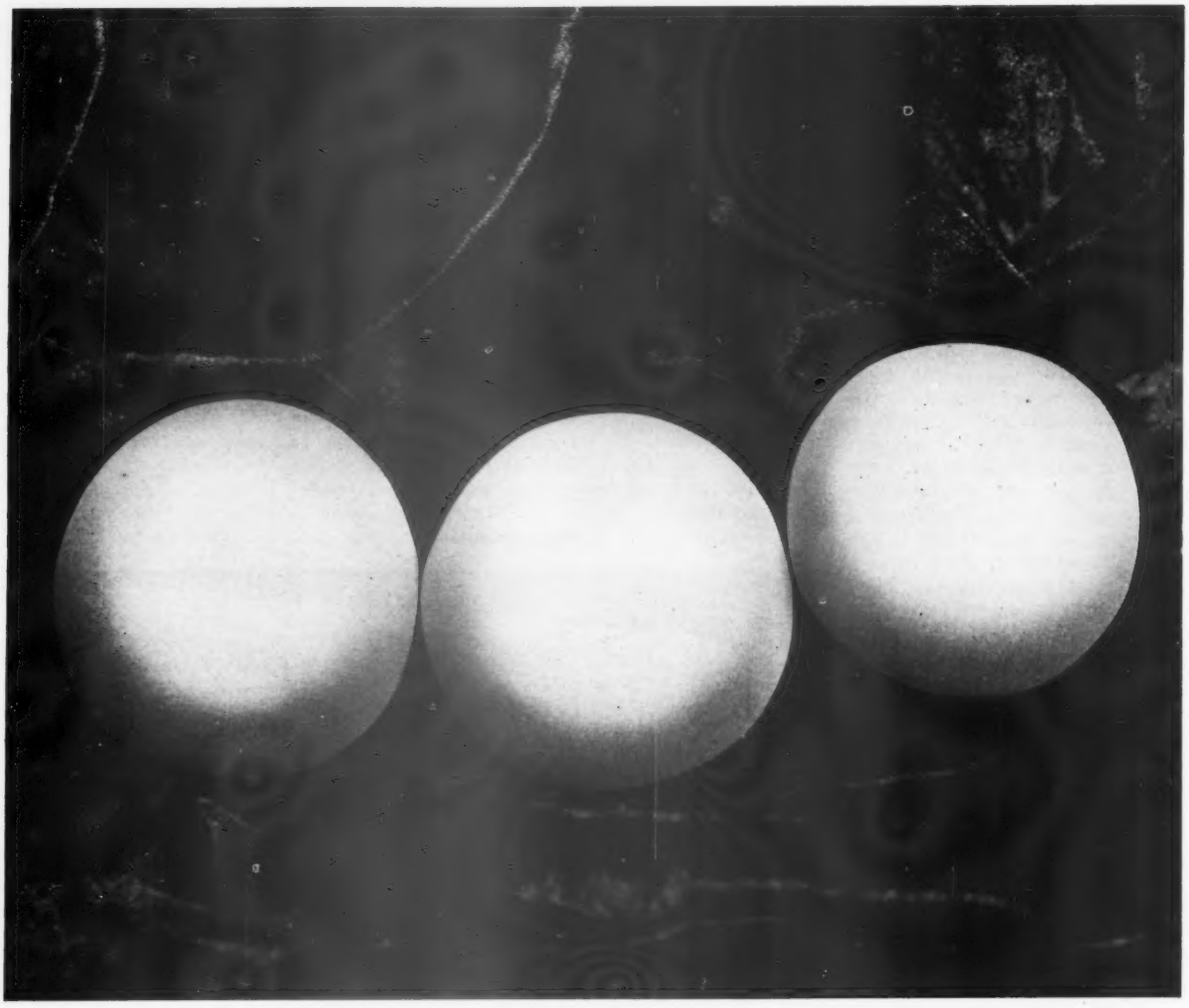
Dr. Maurice H. Bigelow has been appointed Technical Director. Formerly director of Research, he will head Barrett's Research and Development Department and will be located in New York City. The Division's technical program had been directed by C. G. Stupp, Vice President, whose retirement became effective December 31, 1956.

Dr. Werner E. Kleinicke has been appointed Director of Research and will be located at the Glenolden, Pa. Laboratory. He was formerly Director of the Shadyside Applications Research Laboratory, Edgewater, N. J. Since joining Barrett in 1948, Dr. Kleinicke has been a group leader in and a supervisor of applications research.

Wolcott L. Steele has been appointed Director of Development for Barrett. Formerly Chief Project Engineer, he will supervise engineering development, process design, and pilot plants, with headquarters in Philadelphia, Pa.

Bruce T. McMillan has been appointed Director of the Shadyside Applications Research Laboratory in Edgewater, N. J. Prior to his appointment, he was supervisor of the plastics applications group at Shadyside.

James B. Maguire has been appointed to the staff of Barrett's Research and Development Department as chemical engineering advisor to the Technical Director. He has been associated with Barrett for 23 years.



McDANEL NEW IMPROVED HIGH DENSITY GRINDING BALLS WEAR LONGER—GRIND FASTER

Improved manufacturing procedures and higher firing temperatures make the New McDanel Super High Density Grinding Ball even better than before! You get a superior grinding ball that retains its shape and lasts much longer. Complete vitrification gives extra toughness, less pickup and contamination and greater mill economy. 2½", 2", 1¾", 1½", 1¼", 1", ¾" and ½" sizes. 3" size on request. Change to New McDanel Super High Density Grinding Balls today. You'll begin to realize more profit and economy from your present mills if you do.

McDANEL Industrial CERAMICS

McDANEL
REFRACTORY PORCELAIN COMPANY
BEAVER FALLS · PENNSYLVANIA

Send for Bulletin B1-56 today. Get the facts on better ball mill grinding.

PATTERSON FOUNDRY

Everett A. Sisson has been appointed Director of Sales of The Patterson Foundry and Machine Co., East Liverpool, Ohio, according to an announcement by C. W. Gerster, company president.

E. A. Sisson

Prior to his joining Patterson, Mr. Sisson was Sales Manager of The Osborn Manufacturing Co., Cleveland. He is a member of the American Management Association and the National Sales Executive Association.

D. H. Wheeler

J. W. Haun

GENERAL MILLS

Dr. Donald H. Wheeler has been appointed Head of the Chemical Research Department of the General Mills' Research Laboratory, Minneapolis, Minn., according to an announcement by Dr. Harold Wittcoff, Director of Chemical Research.

Dr. Wheeler joined General Mills' Research Laboratories in 1943 to head up research in fats and oils. He transferred to the Chemical Division as director of technical sales and service in 1949 but was recalled to the Laboratories two years later, as principal chemist.

Dr. Wittcoff also announced that **Dr. J. William Haun** has joined the General Mills Research staff as Head of the Chemical Engineering Department.

Dr. Haun holds a Bachelor's degree in Chemical Engineering from the University of Texas and received his Ph.D. degree from the same institution in 1950. Prior to his present association, he was employed by the Monsanto Chemical Co., both in their Springfield, Mass. and Texas City, Texas installations.

V. J. DOLAN

Anton E. Pegis has joined the laboratory staff at V. J. Dolan & Company, Inc., Chicago manufacturer of industrial finishes.

Mr. Pegis has been actively engaged in research development and service in the wood and metal finish field for many years. He is a graduate of the University of Wisconsin.

COLTON CHEMICAL

H. W. Strong, Jr., has been appointed Vice-President in Charge of Operations for Colton Chemical Co., a division of Air Reduction Company, Inc.

A graduate of California Institute of Technology where he received a B.S. degree, Mr. Strong was with Harshaw Chemical Co. from 1946-52 as Development Laboratory Group Leader, Catalyst Sales Department member and assistant to the Vice-President in Charge of Manufacturing.

Mr. Strong joined Colton Chemical Co. in 1952 as New Products Manager. Subsequently, he was appointed Production Manager and Superintendent of Colton's Cleveland plant, prior to his present assignment.

BRIGHTON

Richard G. Hext has been named sales manager for the Brighton Corp., according to Alvin Hock Sr., company president. Mr. Hext will also be responsible for coordinating and supervising all sales and sales promotion activities of the Hamilton Copper & Brass Works and F. C. Deckebach Sons Co., divisions of the parent company.

R. G. Hext

During the past 18 years Mr. Hext has served in various sales and sales promotion capacities within the metal working industry. Prior to that he was sales promotion manager for a large corporation in New York.

REICHHOLD

Morton M. Gruber, well known in the resin field for 26 years, has been named Sales Manager of Surface Coating Resins for Reichhold Chemicals, Inc.


M. M. Gruber

Mr. Gruber had been sales manager of the Resin Department of Archer-Daniels-Midland Co. and predecessor firms for the last 13 years. He first became active in resin sales when he joined Strook and Wittenberg Corp. in 1930. In 1938 this firm was merged with U.S. Industrial Chemicals, Inc., and, in 1943, Mr. Gruber was named Sales Manager, a position he retained when his firm became part of Archer-Daniels-Midland.

ORONITE CHEMICAL

E. J. Van Buskirk has been appointed manager of a new Northeastern sales district for the Oronite Chemical Co., with headquarters in New York City. He will handle Oronite's sales program in New York, northern New Jersey, the New England states, and eastern Canada.

B. W. Colaianni has been named manager of the company's new Southeastern sales district, with offices in Wilmington, Del. He will handle company operations in southern New Jersey, eastern Pennsylvania, and the South.

J. H. Selby has been appointed manager, special accounts, Eastern sales region.

J. R. Stitt will continue to supervise Oronite's eastern regional sales and will coordinate the activities of the new sales districts.

KENTUCKY COLOR

R. M. Ladd has joined the company as Director of Research and Development. For the last seven years he was with Dominion Colour and Chemical Co. of Toronto, Canada, and on terminating his connection there was Vice-President and Managing Director.


R. M. Ladd

Before his Canadian affiliation, Mr. Ladd served for four years with Zinsser & Co. He is a graduate of Dartmouth University, with graduate work in chemistry at Brooklyn Polytechnic Institute.

Mr. Ladd will devote his time at Kentucky to an enlarged research program, which emphasizes tested pigment performance under varied end-use applications.

WITCO CHEMICAL

Dr. Edward F. Wagner has been appointed to the newly created position of Manager of Development for Witco Chemical Co. In his new position, Dr. Wagner will formulate and carry out an overall program designed to broaden the manufacturing activities of Witco and its wholly owned subsidiaries, Emulsol Chemical Corp., of Chicago, Ill., and Ultra Chemical Works, of Paterson, N. J.

To assist in the expansion program, a development committee was also organized with Dr. Wagner as Chairman. Other members are **Dr. M. M. Gladstone,** Manager of Technical Service for Emulsol Chemical Corp. and **Albert Sharphouse,** Executive Vice President of Ultra Chemical Works.

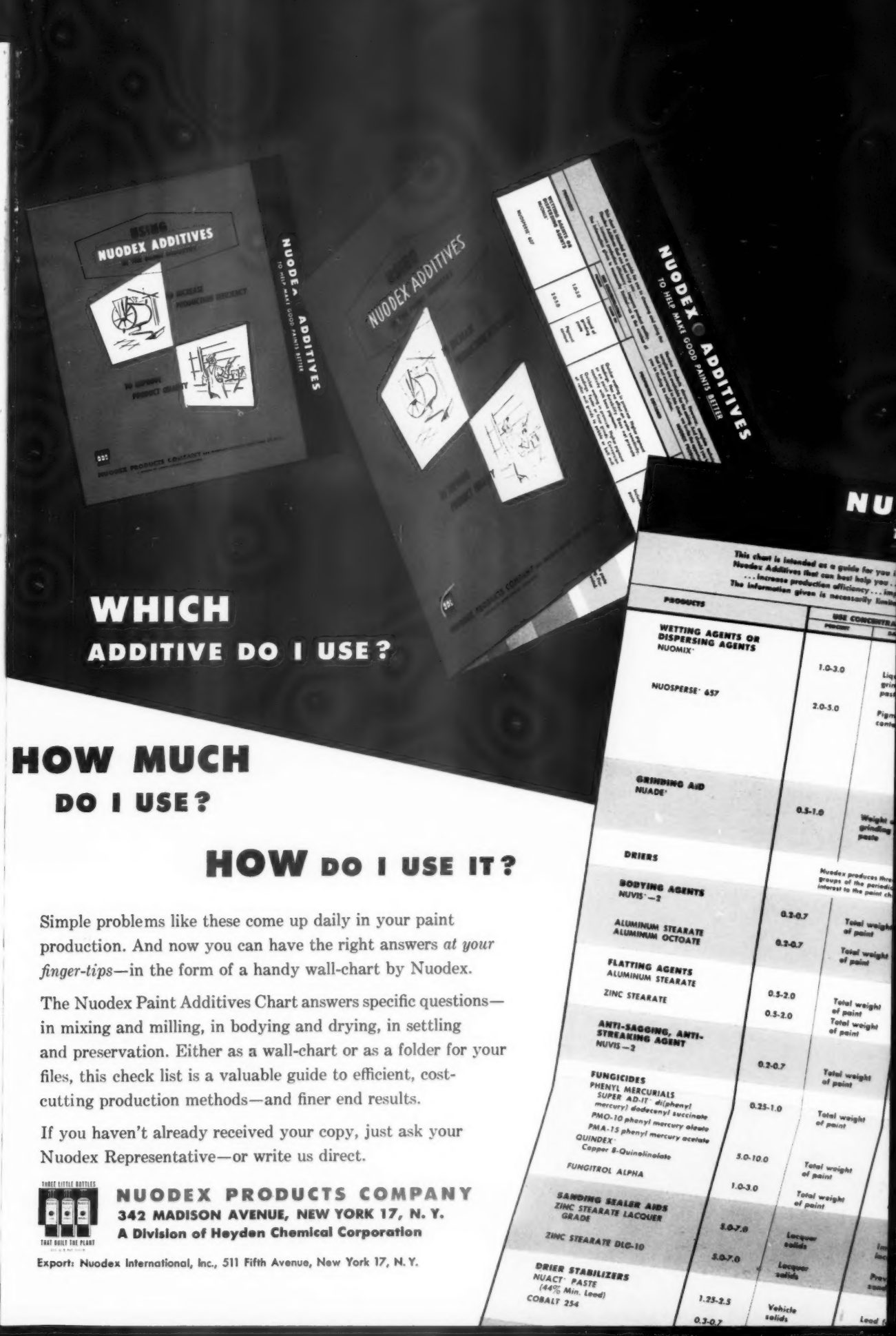
Dr. Wagner, who was formerly Director of Witco's Technical Service Laboratory, Chicago, received his doctorate from Illinois Institute of Technology.

U.S. HOFFMANN

Irving Fein has been appointed as Executive Vice President of his company in charge of all commercial activities.


Irving Fein

Mr. Fein became a director of Hoffmann when the latter acquired the Atlas Group of can companies a year ago. At that time, Mr. Fein was president and principal stock holder of the Atlas Group, which subsequently became the can and container division of United States Hoffmann Machinery Corp.



Simple problems like these come up daily in your paint production. And now you can have the right answers *at your finger-tips*—in the form of a handy wall-chart by Nuodex.

The Nuodex Paint Additives Chart answers specific questions—in mixing and milling, in bodying and drying, in settling and preservation. Either as a wall-chart or as a folder for your files, this check list is a valuable guide to efficient, cost-cutting production methods—and finer end results.

If you haven't already received your copy, just ask your Nuodex Representative—or write us direct.

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The proof is piling up!

Isophthalic Based House Paints are Vastly Superior

Exterior house paints based on Isophthalic—

***have** uniform through-dry—no paint wrinkling*
Oronite's extensive testing, plus results by leading resin manufacturers, prove Isophthalic greatly superior to other materials in this regard.

***have** faster drying properties*
The higher, more uniform molecular weights give a dry film — quicker.

***have** practically no yellowing in light tints*
With Isophthalic, oils can be used which greatly reduce the amount of normal paint yellowing.

***have** mildew resistance*
This quality appears to result from less unattached fatty acids present.

***have** outstanding flexibility characteristics*
At longer oil lengths greater flexibility results from higher proportion of flexible fatty acids in the molecule.

***have** better color retention*
Closer bonding of pigment particles give more uniform color appearance after application.

***can be** manufactured at lower cost*
Manufacturing costs can be reduced because more low-cost oils can be used.

Resin and paint manufacturers can now offer new and improved products with Oronite's new, advanced raw material — Isophthalic. Contact any Oronite office for complete information—or ask your resin or paint manufacturer about Isophthalic.

ORONITE CHEMICAL COMPANY

EXECUTIVE OFFICES: 200 Bush Street, San Francisco 20, California

SALES OFFICES

30 Rockefeller Plaza, New York 20, N. Y. Carew Tower, Cincinnati 2, Ohio
20 North Wacker Drive, Chicago 6, Illinois 714 W. Olympic Blvd., Los Angeles 15, Calif.
Mercantile Securities Bldg., Dallas 1, Texas 450 Mission Street, San Francisco 5, Calif.

EUROPEAN OFFICE

36, Avenue William-Favre, Geneva, Switzerland

4021

U. S. INDUSTRIAL

Warren E. Johnson has been named Manager of Alcohol and Chemical Sales for U. S. Industrial Co., Division of National Distillers Products Corp. Mr. Johnson will have responsibility for sales of U.S.I. industrial alcohol, solvents and other chemicals.

W. E. Johnson

A graduate of the University of Rhode Island, Mr. Johnson has been with the U.S.I. sales organization since 1940. He became Manager of the Boston Sales Division in 1944 and Manager of U.S.I. chemical sales in 1950.

With this change, Mr. Johnson becomes responsible for industrial alcohol sales in addition to his previous product responsibilities. U.S.I. alcohol sales had formerly been under **Alden R. Ludlow, Jr.,** who was recently named Director of Sales for the company.

Mr. Ludlow, recent appointee as Director of Sales, has been with U.S.I. since he was graduated from Yale University in 1934, with the exception of several wartime years spent overseas with the U. S. Air Force. He had been U.S.I.'s Manager of Alcohol Sales for the past 10 years.

KADY INTERNATIONAL

Johan H. G. Reinders has been named Resident Manager of the Amsterdam, Netherlands offices of the Kady International Corp., export and import subsidiary of Kinetic Dispersion Corp.

J. H. G. Reinders

Mr. Reinders has had wide experience in the sale of chemical and paint-making machinery in Europe. His knowledge of machine application is being counted on to be of assistance to the European users of Kinetic Dispersion Corporation's machinery.

EMERY INDUSTRIES

John V. Killheffer, Jr., has joined the research staff at Emery Industries, Inc. He will be associated with the plasticizer group of the Process Research Section, where he will work on both new and current plasticizers for Emery's extensive line.

Prior to joining Emery, Mr. Killheffer was a chemist with the Organic Chemicals Department at E. I. du Pont de Nemours & Co. He holds the degrees of B.S. from the Massachusetts Institute of Technology and M.S. from the University of North Carolina.

CUNO ENGINEERING

George Whorf has been assigned as Manager of the new Cincinnati branch office for Cuno Engineering Corp., Meriden, Conn.

As a sales engineer for the past three years in Cuno's home office, Mr. Whorf has been active in processing Cuno filter sales in the Cincinnati area. He is said to be thoroughly familiar with local application problems there.

ACORN PAINT

Martin J. Monahan has joined The Acorn Paint and Chemical Co. of Cleveland as Technical Director, after serving for many years with American Marietta Co. of Kankakee, Ill., and Seck-De Vault Paint Co. of Springfield.

Mr. Mohahan holds a Bachelor of Science degree from the Newark College of Engineering.

VALSPAR

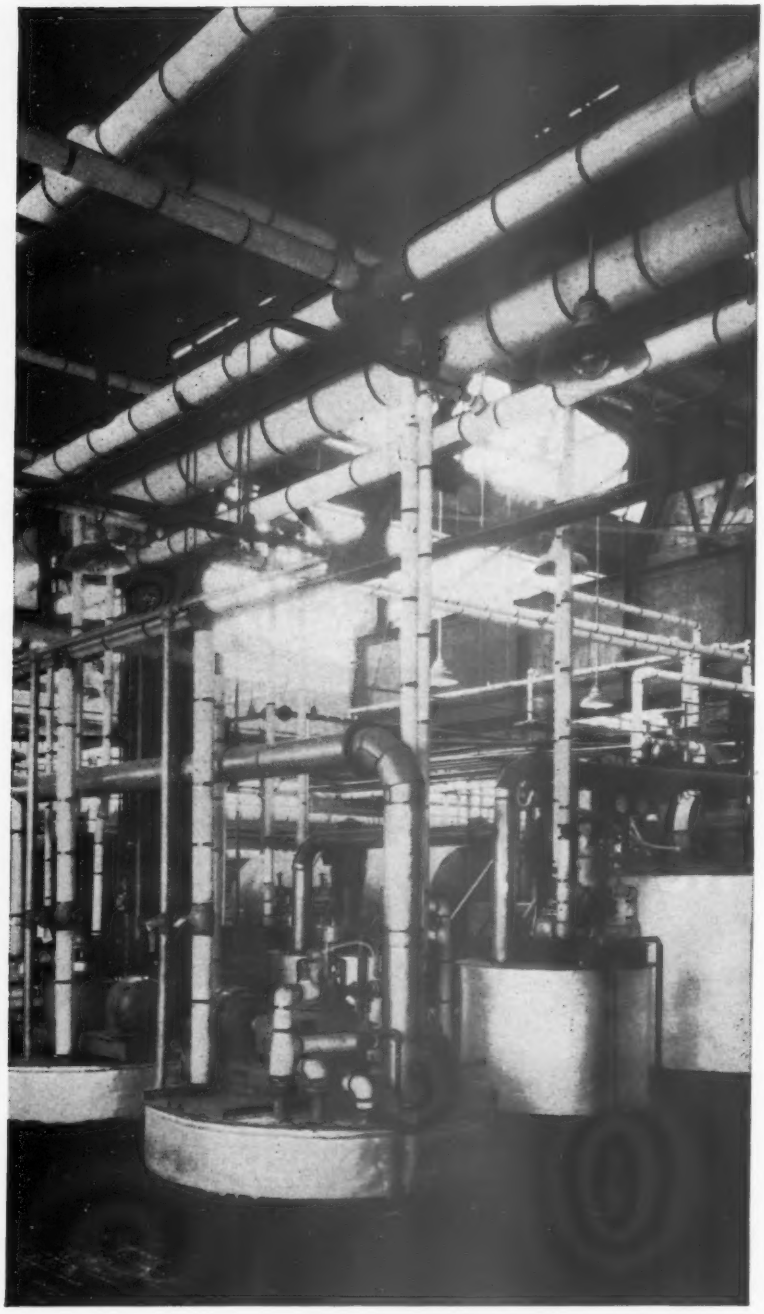
Dr. Charles A. Coffey has been appointed Technical Director of the Valspar Corp. He will headquarter at Valspar's Lyons, Ill. plant and will assume complete control of all laboratory and technical functions.

C. A. Coffey

Dr. Coffey, who brings to Valspar more than 23 years of experience in the oil and paint industries, received his Ph.D. in chemistry from the University of Iowa. Prior to his new appointment, Dr. Coffey headed group research programs and worked as technical director in the paint and varnish fields.

HARSHAW DRIERS

MODERN EQUIPMENT INSURES UNIFORM HIGH QUALITY



Order your next requirement of driers from Harshaw.

Precise manufacturing specifications demand the following tests for every batch of driers produced:

Metal content
Specific gravity
Color
Viscosity
Total solids content
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Moisture content
Acid value
Miscibility with raw linseed oil
Miscibility with mineral spirits
Benzene insoluble content
Customer's specified tests

Harshaw Driers are distributed nationwide through 18 stock points. Your order will be shipped from the nearest warehouse.

TYPICAL HARSHAW DRIERS

LIQUID DRIERS

Uversol (Naphthenate) Liquids
Linoresinate Liquids
Linoleate Liquids
Lithos
Octasols
Pastes
Pastalls

SOLID DRIERS

Uversol (Naphthenate) Solids
Linoresinate Solids
Linoleate Solids
Soyate Solids
Fused Resinates

POWDERED DRIERS

Precipitated Resinates
Drying Salts:
Cobalt Lead Manganese
Zinc

YOURS FOR THE ASKING —
Harshaw's Revised 36-page Drier Book.

THE HARSHAW CHEMICAL COMPANY

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CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HASTINGS-ON-HUDSON, N. Y.
HOUSTON • LOS ANGELES • PHILADELPHIA • PITTSBURGH

METALSALTS

Raymond J. Fallon has been named Assistant Sales Manager of Metalsalts Corp. He will be responsible for the sale of Meta-San, the Corporation's new phenyl mercuric propionate additive for the inhibition of bacteria and fungi in organic coatings.

R. J. Fallon

Mr. Fallon was graduated from Fordham University in 1942 with a B.S. degree in Chemistry. After serving as an officer in the U. S. Navy during World War II, he became identified with the chemical industry, joining Metalsalts in 1954.

ARCHER-DANIELS-MIDLAND

Marvin W. Formo, Alexander Olotka and **Louis I. Hansen** of the research staff of Archer-Daniels-Midland Co. have been promoted to new positions, according to an announcement by James C. Konen, ADM vice president in charge of research.

Dr. Formo, formerly research coordinator, and Dr. Olotka, director of ADM's Newark, N. J. resin laboratory, were advanced to assistant research directors. Meanwhile, Dr. Hansen received a promotion from research supervisor to senior research associate.

Dr. Formo, who joined ADM in 1946 as a chemist, is a graduate of the University of Minnesota and received a doctor's degree in chemistry from Cornell University. Prior to joining ADM he was associated with Procter and Gamble.

Dr. Olotka, a graduate of the City College of New York, was director of resin research laboratories for Robert Rauh, Inc., and U. S. Industrial Chemicals Co. before joining ADM in 1954 as director of the Newark laboratory.

Dr. Hansen joined ADM's central research laboratory in Minneapolis in 1942 as a group leader in the copolymer section. A graduate of Augsburg College, he holds a doctor's degree from the University of Minnesota. Prior to his association with ADM, Dr. Hansen was a member of the research staffs of Sinclair Oil & Refining Co., and Firestone Tire & Rubber Co.

SHAWINIGAN RESINS

Dr. Jerry Koral, who formerly was a research fellow in the chemistry department of Brooklyn Polytechnic Institute, has joined the research department of the company.

In his new position, Dr. Koral will be responsible for research on the physical chemistry of polymers. His fellowship grant was sponsored by the Office of Naval Research.

GENERAL ELECTRIC

Milton C. Lauenstein and **Robert T. Daily** have been named as district managers for two new sales districts of the Silicone Products Department of General Electric Co. Mr. Lauenstein will head a Chicago Sales District and Mr. Daily will head a Western Sales District with headquarters at Los Angeles.

Mr. Lauenstein, who received his Chemical Engineering degree from Purdue University in 1945, came to the Silicone Products Department from the Norton Co. in 1951. He has served as a sales development specialist at the headquarters office in Waterford, N. Y., and has been assigned to the sales offices in Cleveland and Chicago.

The other new district manager, Mr. Daily, transferred to his new post from the department's Dallas office. Formerly sales manager at the Lord Manufacturing Co., he joined General Electric in 1954.

MIXING EQUIPMENT

Richard D. Boutros has been advanced from chief engineer to vice president and director of engineering at Mixing Equipment Co., Inc., Rochester, N. Y. He had served as chief engineer since 1949.

Mr. Boutros joined the engineering staff of Mixing Equipment Co. in January, 1946, following wartime service as a lieutenant in the U. S. Navy. A graduate of the University of Virginia, he holds a degree in mechanical engineering.

National Lead Company, Experimental Test Station, Sayville, Long Island, is set up to develop facts on the durability, beauty, and practicability of house paints. In existence since 1917, it now has 2½ miles of test fences, more than 30,000 active tests.

FOOLPROOF

your exterior paints
with Dutch Boy® "45X"

(Basic Silicate White Lead)

TAKE IT from leading makers of exterior paints: for *uniform* performance, you need lead.

And take it from Sayville, National Lead's Experimental Test Station, "Dutch Boy" Basic Silicate White Lead "45X" *assures* uniform performance. No matter how much exposure conditions – or painting practices – vary!

Think about your white House Paints, for example.

With "45X" – Sayville tests show – you definitely improve self-cleaning. Yet, you preserve film integrity!

In tinted House Paints, you step up film durability with "45X". Also resistance to color changes! In Primers, you step up adhesion.

And so it goes!

Everytime you put "45X" into exterior paints, you improve one property or another underlying *uniform* performance.

This minimizes complaints. Saves you time. And money! You, you alone, know what it costs to run down complaints yearly. And the complaints you *don't* hear about! Even you don't know what they cost – in repeat business and good-will.

Fewer complaints—
fewer pounds of lead, too!

That's because the reactive portion of each "45X" pigment particle is concentrated at the surface. This makes proportionately larger amounts of lead *available.*

Fewer complaints, fewer pounds of lead! You just can't lose, putting "45X" in your exterior paints!

NATIONAL LEAD COMPANY, 111 Broadway, New York 6, N. Y.
In Canada: **CANADIAN TITANIUM PIGMENTS LIMITED,** 630 Dorchester Street, West · Montreal

BAKELITE

G. L. Pitzer, C. W. Blount, and **J. D. Benedito** have been named as vice presidents for Bakelite Co., a division of Union Carbide and Carbon Corp.

Mr. Pitzer, who will be Vice President—Production, started with Union Carbide in 1933 in the South Charleston, W. Va., laboratory of Carbide and Carbon Chemicals Co. He has held various positions in the Union Carbide organization including that of Superintendent of the Canadian Resins and Chemicals Ltd. plant at Shawinigan Falls, P.Q., Canada, and Assistant Superintendent, Texas City plant, of Carbide and Carbon Chemicals Co. In 1952 he moved to New York to fill the post of Works Manager for Bakelite Co.

Mr. Blount, who will be Vice President—Marketing, joined Bakelite Co. in 1924 as a sales engineer. In 1932 he was appointed Assistant Sales Manager, becoming Vice President and General Sales Manager in 1944. He was made Vice President in Charge of Sales in 1953.

Mr. Benedito, newly assigned as Vice President—Sales, began with Carbide and Carbon Chemicals Co. as a sales trainee in 1935. In 1942, he was transferred to the Canadian Resins and Chemicals Ltd. as Sales Manager. He was appointed Division Sales Manager for the Bakelite Co. in New York in 1948, becoming General Sales Manager in 1956.

Bakelite Co. has also announced the appointment of three general managers. **Dr. A. W. Downes** has been appointed as General Manager—New Resins and Compounds, **A. A. Boehm** has been appointed General Manager—Phenolics, and **R. D. Glenn** has been appointed General Manager—Vinyls.

Dr. Downes will assist in coordinating and expediting all activities on new resins and compounds. He joined Union Carbide in 1933 as a chemist at Carbide and Carbon Chemicals Co., South Charleston, W. Va. Prior to his present assignment, Dr. Downes was Associate Director of Development, Bakelite Co.

Mr. Boehm will assist in coordinating and expediting all activities on phenolic resins and compounds. He joined Union Carbide with Bakelite Co., Bound Brook, N. J., in 1935. Mr. Boehm was most recently Production Superintendent, Bakelite Co., Bound Brook plant.

Mr. Glenn will assist in coordinating and expediting all activities on vinyl resins and compounds. He joined Union Carbide in 1934 as chemical engineer at Carbide and Carbon Chemicals in South Charleston, W. Va. Mr. Glenn was most recently Assistant Works Manager, Carbide and Carbon Chemicals Co.

A newly created position of Manager—Technical Planning has been filled by the appointment of **H. F. Robertson.** Mr. Robertson will be concerned primarily with future and long-range technological effort of the Research and the Product and Process Development groups.

Mr. Robertson first became associated with Union Carbide when in 1926 he was transferred to the Union Carbide-sponsored Chrome Ore Fellowship at Mellon Institute, Pittsburgh, Pa. In the past he has held such positions with Union Carbide as Manager—Development Department, Plastics Division, and most recently Manager—New Products Engineering Department.

Dr. R. F. Clash, Jr., will succeed Mr. Robertson as Manager—New Products Engineering Department.

CROWN CORK & SEAL

W. D. Regnier has been appointed division manager of sales for the machinery division of the Crown Cork & Seal Company, Inc., succeeding **Ralph E. Costa,** who recently resigned from the company. Mr. Regnier formerly was manager of customer service in machinery sales in the crown & closure division of the company.

In 1940, Mr. Regnier first joined Crown Cork & Seal as a project engineer in the machinery division. From November, 1954 to January, 1956, he was sales manager of packaging machinery in the machinery division.

Prior to his affiliation with Crown Cork & Seal, Mr. Regnier served as an engineer with the Glenn L. Martin Co.

CONNECTICUT FILTER

John E. McKay has been appointed Regional Manager of Distributor Sales for Connecticut Filter Corp., a division of Cuno Engineering Corp., Meriden, Conn.

Mr. McKay was previously with Henry G. Thompson & Sons Co., New Haven, where he was active in sales through industrial distributors.

In his new job, he will have responsibility for sales of Cuno Micro-Klean filters and cartridges.

CELLOFILM INDUSTRIES

Leo L. Bromley has been appointed Technical Director for Cellofilm Industries, Inc., Woodridge, N. J.

Mr. Bromley, a chemical engineer, brings with him to the new position an extensive background in the paint and lacquer industry. As Technical Director at Cellofilm, he will head the customer service division.

PRODUCTION TIPS

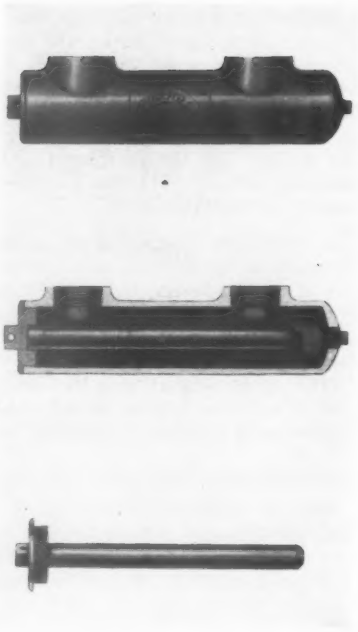
Magnetic Trap Removes Steel Fines in Paint Processing Lines

RINSHED-Mason Company, Detroit, Mich., manufacturers of automotive undercoat and enamels, report that an installation of Eriez Model L permanent magnetic Ferrotraps is affording their products effective protection from contamination by extremely fine ferrous particles incidental to processing operations. Origin of the contaminants is in the paint-grinding ball mills where minute particles of steel, in the range of a few thousandths of an inch, are occasionally chipped off the grinding balls.

To preserve the high quality of the company's products, it is desirable to remove even these infinitesimal particles. For this purpose, the Eriez Ferrostraps are installed directly at the outlet of the mills, so that their entire contents are caused to flow through the powerful magnetic field maintained by the Alnico V magnetic element positioned inside the trap. These units are replacing a bed of flat electromagnets formerly employed in this connection.

The Model L consists of a single, long permanent magnetic element contained in an all-bronze housing having two openings in the upper side adaptable to pipelines of ½" to 2" diameter. Standard fittings permit the unit to be quickly and easily installed in new or existing pipelines, so that liquids flowing through the line are brought into contact with the powerful magnetic element which snatches any ferrous particles to its surface and retains them until the element is withdrawn for periodic cleaning.

Complete information concerning the Ferrotraps may be obtained by addressing Eriez Manufacturing Company, Erie 6, Pa.



One above the other, the permanent, magnetic trap, a cutaway showing how the inner tube fits into the trap, and in lower photo the single Alnico-V powered magnetic element which may be removed so that the iron contamination can be cleaned off.

Above photo shows where the trap is located in Rinshed-Mason Company's plant. Lower photo shows the magnetic element removed and covered with fine iron contamination, consisting of minute steel particles occasionally chipped off steel grinding balls during dispersion.

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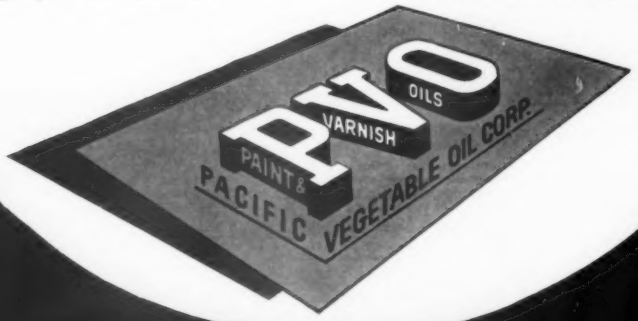

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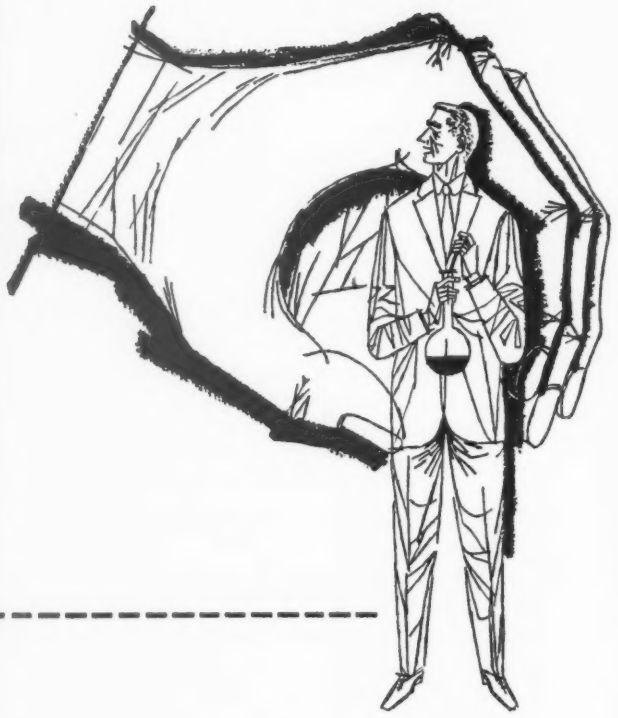

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PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

Pigmented Base

U. S. Patent 2,765,285. Edward Louis Weller, Jr., East Orange, N. J.

A process for producing a dense, free-flowing pigmented base suitable for use in the production of paints, enamels, lacquers and related finishes, which comprises mixing together in a low-powered mixing mill a dough-like mixture of a pigment and a solvent- and resin-containing vehicle, said vehicle containing insufficient solvent to impart fluidity to said mixture by containing sufficient resin to provide 2 to 8% resin based on the weight of the entire mixture, and continuing the mixing until the mixture is reduced to a free-flowing uniform fluid suspension.

Protective Coating

U. S. Patent 2,765,237. Folsom E. Drummond, Washington, D.C., assignor to Midland Chemical Corp., Dayton, Ohio, a corporation of Delaware.

A protective metal coating composition which is resistant to abrasion and atmospheric conditions conducive to corrosion, which is composed of finely divided zirconium metal particles dispersed in liquid sodium silicate, said zirconium metal particles being of a particle size such that approximately 80% passes a 200-mesh screen and the same is mixed with sodium silicate in the proportionate amounts in parts by weight of between about 60-120 parts zirconium metal and 20-40 parts sodium silicate, the resultant composition being adapted to be applied to a metal surface to form on baking at a temperature of 200-300° F. a continuous, hard, tenacious adherent protective coating film thereover.

Synthetic Resins

U. S. Patent 2,764,575. Rudolf Kohler and Helmut Pietsch, Dusseldorf, Germany, assignors to Henkel & Cie. G. m. b. H., Dusseldorf, Germany, a German corporation.

As a new synthetic resin a condensation product of a compound having at least 2 oxyacyclobutane rings with a member selected from the group consisting of polycarboxylic acids, polycarboxylic acid anhydrides, and polycarboxylic acid chlorides.

Air Curing Coating

U. S. Patent 2,772,249. Edward Cousins, Akron, and Frank A. Jeffries, Cuyahoga Falls, Ohio, assignors, by mesne assignments, to The Goodyear Tire & Rubber Co., a corporation of Ohio.

A method of making a tenaciously adherable erosion-resistant fluid coating composition which is capable of being air-cured by exposure to the atmosphere at ordinary temperatures for a period of from 2 to 72 hours comprising the steps of preparing a composition comprising a polychloroprene, a fumed silica, a metallic oxide in an amount less than 10% by weight of the polychloroprene, the composition being dispersed in equal portions of toluene and amyl acetate, preparing another composition comprising a curing agent selected from the group consisting of catechol, thiocarbanilide, butyraldehyde-aniline, and the condensation product of butyraldehyde and monobutylamine, said curing agent being dissolved in benzene, and combining the curing agent component with the polychloroprene component immediately prior to use to produce said tenaciously adherable erosion-resistant composition said curing agent component being present in the amount of about 2% by weight based on the weight of said polychloroprene.

Modified Melamine Resins

U. S. Patent 2,769,797. Tseng Jiueq Suen, New Canaan, and Yun Jen, Stamford, Conn., assignors to American Cyanamid Co., New York, N. Y., a corporation of Maine.

The process of preparing a water soluble resinous composition comprising the reaction product of melamine, formaldehyde and a polyfunctional ali-

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it's

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Smart skipper! That gleaming white paint was pigmented with TITANOX titanium dioxide pigments. And this durable finish will stay trim for many a regatta.

TITANOX is the No. 1 white pigment for *marine* paints, just as it is for *all* paints . . . and for rubber, plastics, ceramics and paper. Titanium Pigment Corporation (subsidiary of National Lead Company), 111 Broadway, New York 6, N. Y; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1; Vancouver 2.

*TITANOX *is a registered trademark for the full line of titanium pigments sold by Titanium Pigment Corporation.*

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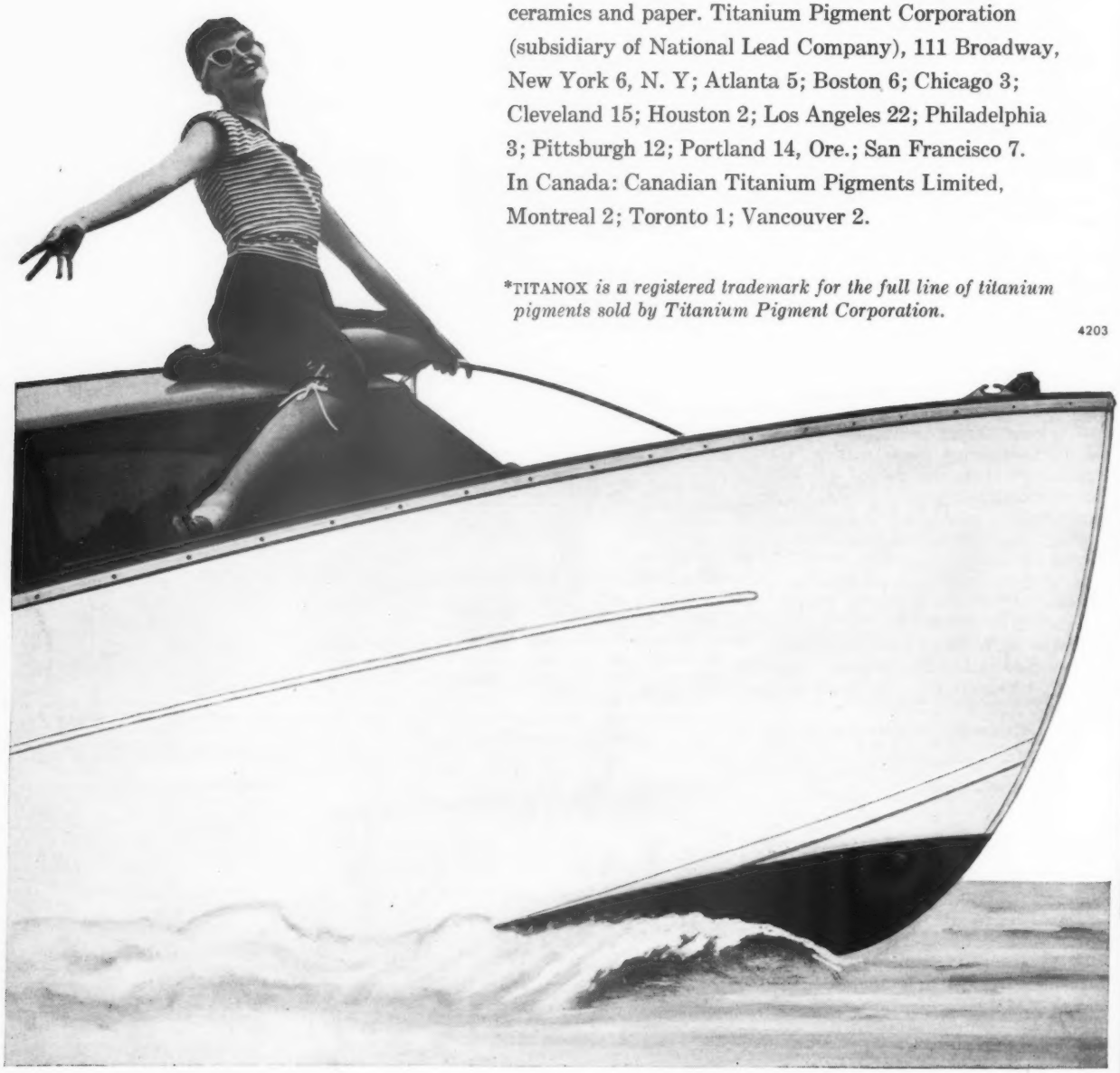


phatic polyamine condensation product selected from the group consisting of (1) ammonia and a difunctional halohydrin, (2) a polyalkylene polyamine and a dihaloalkane wherein the formaldehyde is present in a total amount of at least 8 moles per mole of melamine which comprises reacting a partially polymerized melamine-formaldehyde condensation product having a melamine to formaldehyde mole ratio of from about 1:1.5 to 1:5 respectively, which has been reacted to a point beyond the methylol stage, but short of the gel stage, at a temperature of between about 20° C. and 100° C. with a polyfunctional aliphatic polyamine condensation product providing a carbon to nitrogen ratio not greater than 4:1 respectively, in an amount sufficient to yield between about 0.3 and 10 atoms of nitrogen per mole of melamine; introducing additional amounts of formaldehyde until there is present a mole ratio of melamine to formaldehyde within the range of 1:6 to about 1:14 respectively, continuing the reaction until a viscosity of about 20 centipoises and 800 centipoises measured at 35% solids and 25° C. is obtained; inhibiting further reaction by substantially neutralizing the reaction product, and adding thereto formaldehyde in an amount sufficient to bring the mole ratio of the melamine to total formaldehyde charged to at least 1:8 respectively.

Fungistatic Pigment And Coating Composition

U. S. Patent 2,769,716. James J. Rankin, Beaver, Pa., assignor to St. Joseph Lead Company, New York, N. Y., a corporation of New York.

A composition for coating and the like comprising a vehicle and at least ten percent by weight of a fungistatic zinc oxide pigment having incorporated therein a zinc oxyhalide compound in amount equivalent to from about 0.1 to about 1.0 percent halogen content.

Copolymers of Vinyl Chloride And 1.1-Dichloro-Ethene

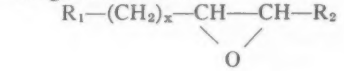
U. S. Patent 2,769,803. Wilhelm Becker, Leverkusen-Bayerwerk, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany.

A liquid coating composition comprising, as a film forming agent, a copolymer prepared by a process which comprises emulsifying at least 15% vinylchloride, at least 15% 1.1-dichloroethene and 1-25% styrene, said percentages being calculated on a total weight of said monomers, in an aqueous medium and copolymerizing said monomers in a single step in the presence of about 0.05 to about 0.5% of a regulating agent; and a solvent for said film forming agent.

Aminoplast Resins

U. S. Patent 2,769,798. Helmut Meis, Walter Scheib, and Karl-Heinz Decker, Letmathe in Westphalia, Germany, assignors to Rutgerswerke-Aktiengesellschaft, Frankfurt am Main, Germany.

A composition comprising a heat-hardenable amine-formaldehyde resin selected from the group consisting of urea-, thiourea-, iminourea-, and melamine-formaldehyde resins and a stabilizing compound corresponding to the general formula



wherein R_1 stands for an organic radical selected from a first group consisting of acyl, carboxyl, alkoxy, cycloalkoxy, aroxy, alkaroxy, aralkoxy, alkyl, cycloalkyl, aryl, and aralkyl radicals, a second group consisting of radicals of said first group substituted by a hydroxy radical, a third group consisting of radicals of said first group substituted by a secondary amine radical; R_2 stands for a radical selected from the group consisting of H and a radical of said first, second, third and fourth groups, and x is an integer having a value in the range 1-10.

Coating Composition

U. S. Patent 2,768,908. Neville Leverne Cull, Baker, La., assignor to Esso Research and Engineering Company, a corporation of Delaware.

A coating composition comprising a liquid butadiene polymer containing .1 to 5% by weight of ethyl ortho silicate.

Color Improvement in Drying Oils

U. S. Patent 2,768,984. Joseph K. Mertzweiller, Baton Rouge, and Joseph L. Betts, Jr., East Baton Rouge, La., assignors to Esso Research and Engineering Co., a corporation of Delaware.

A process for preparing a substantially colorless synthetic drying oil which comprises heating to 25 to 90° C. a mixture of 75 to 85 parts of butadiene, 25 to 15 parts of styrene, 200 to 300 parts of hydrocarbon diluent and 20 to 30 parts of an ether selected from the group consisting of aliphatic ethers of 4 to 8 carbon atoms and cyclic diether of 4 to 8 carbon atoms in the presences of finely divided sodium at a temperature between 40 and 85° C. until substantially complete conversion is obtained, then continuing the heating in the presence of the unused sodium at 50 to 120° C., for ½ to 1.5 hours.

Vinyl Chloride Polymers

U. S. Patent 2,771,457. Arthur William Barnes, Tewin, Bernard Stephen Dyer, Tewin Wood, Welwyn, and Austin Atkinson Gibson, Cleveleys, England, assignors to Imperial Chemical Industrial Limited, a corporation of Great Britain.

In a process for the production of aqueous dispersions of polymers and copolymers of vinyl chloride by polymerizing vinyl chloride with up to its own weight of ethylenically unsaturated copolymerizable material in the presence of water containing a dissolved peroxy polymerization catalyst, the improvement which comprises obtaining polymer particles of large uniform size by initiating the polymerization in the absence of an emulsifying agent and introducing an emulsifying agent after the polymer content of the system has reached approximately 0.5% by weight of the polymerization system but before the polymer dispersion begins to coagulate, said emulsifying agent being introduced in an amount sufficient to provide mechanical stability but insufficient to impair the properties of the polymer contained in the dispersion produced.

Corrosion Inhibiting Paints

U. S. Patent 2,772,174. Werner L. Riegler, Western Springs, and James G. Atherton, Chicago, Ill., assignors to Armour & Co., Chicago, Ill., a corporation of Illinois.

A paint composition for metal surfaces having incorporated therein from ¼ to 2½ weight percent, based upon the amount of pigment, of a salt of a fatty acid having from 8 to 22 carbon atoms and a diamine having the general formula:

$$R—NH—(CH_2)_x—NH_2$$

wherein R is an aliphatic hydrocarbon radical having from 8 to 22 carbon atoms and x is an integer of from 2 to 10.

Reducing Viscosity of Gums

U. S. Patent 2,767,167. Joseph W. Opie, Robert Nordgren, and Robert M. Hamilton, Minneapolis, Minn., assignors to General Mills, Inc., a corporation of Delaware.

Process of reducing the viscosity of mannan gums which comprises treating the gum at a temperature within the approximate range of 65-100° C. with a solution of hydrogen peroxide in an aqueous solution of a water-miscible lower aliphatic alcohol, containing at least 50% alcohol by volume.

Polyamide Modified Melamine Resins

U. S. Patent 2,769,799. Tseng Jiueq Suen, New Canaan, and Yun Jen, Stamford, Conn., assignors to American Cyanamid Co., New York, N. Y., a corporation of Maine.

The process of preparing a water-soluble resinous material which comprises reacting melamine, formaldehyde and a polyfunctional aliphatic polyamine at a temperature between about 20° C. and about 100° C. until a viscosity of between about 20 centipoises and about 800 centipoises measured at 35% solids and 25° C. is obtained, thereafter neutralizing said resinous material, wherein the formaldehyde is present in an amount greater than 6 mols per mol of melamine, wherein said polyamine has a carbon to nitrogen ratio not greater than 4:1, respectively, and the polyfunctional aliphatic polyamine is present in an amount to yield between about 0.5 and about 10 atoms of nitrogen per mol of melamine, and wherein the product produced is infinitely dilutable in neutralized water at a temperature between about 25° C. and 30° C.

Pigment Compositions

U. S. Patent 2,769,721. Egon Frankl, Rochester, N. Y., assignor to Rochester Button Co., Rochester, N. Y., a corporation of New York.

A method of making readily dispersible dry lamellar pearlescent pigment compositions which comprises adding a Werner type complex compound of trivalent chromium with an aliphatic carboxylic acid of the group consisting of alpha, beta unsaturated aliphatic carboxylic acids containing from 2 to 6 carbon atoms in the aliphatic chain and long chain fatty acids containing from 10 to 20 carbon atoms to an aqueous dispersion of a lamellar pearlescent pigment selected from the group consisting of acid lead phosphate and acid lead arsenate and thereafter separating the pigment from the dispersion and drying the pigment.

Melamine-Formaldehyde-Poly-Amine Condensation Product

U. S. Patent 2,769,796. Tzeng Jiueq Suen, New Canaan, and Yun Jen, Stamford, Conn., assignors to American Cyanamid Co., New York, N. Y., a corporation of Maine.

The process of preparing a water-soluble resinous material which comprises reacting melamine, formaldehyde and a polyfunctional aliphatic polyamine condensation product selected from the group consisting of (1) ammonia and a difunctional halohydrin, (2) a polyalkylene polyamine and a difunctional halohydrin and (3) a polyalkylene polyamine and a dihaloalkane at a temperature between about 20° C. and about 100° C. until a viscosity of between about 20 centipoises and about 800 centipoises measured at 35% solids and 25° C. is obtained, thereafter neutralizing said resinous material, wherein the formaldehyde is present in an amount greater than 6 mols per mol of melamine, wherein said polyamine has a carbon to nitrogen ratio not greater than 4:1, respectively, and the polyfunctional aliphatic polyamine condensation product is present in an amount to yield between about 0.5 and about 10 atoms of nitrogen per mol of melamine and wherein the product produced is infinitely dilutable in neutralized water at a temperature between about 25° C. and 30° C.

Polyamine Modified Melamine-Formaldehyde Resins

U. S. Patent 2,769,800. Tzeng Jiueq Suen, New Canaan, and Yun Jen, Stamford, Conn., assignors to American Cyanamid Co., New York, N. Y., a corporation of Maine.

The process of preparing a water-soluble resinous material comprising the reaction product of melamine, formaldehyde and a polyfunctional aliphatic polyamine wherein the formaldehyde is present in a total amount of at least 8 mols per mol of melamine which comprises treating a partially polymerized melamine-formaldehyde condensation product having a melamine to formaldehyde ratio of from about 1:1.5 to 1:5, respectively, at a temperature between about 20° C. and 100° C. with a polyfunctional aliphatic polyamine providing a carbon to nitrogen ratio not greater than 4:1, respectively, in an amount sufficient to yield between about 0.5-10 atoms of nitrogen per mol of melamine; introducing formaldehyde until the mol ratio of melamine to formaldehyde lies within the range of from 1:6 to 1:15, respectively; reacting the mixture until an end point viscosity of between about 20 centipoises and 800 centipoises measured at 35% solids and 25° C. is obtained; inhibiting further reaction by substantially neutralizing the polymerized product and adding to the reaction product additional formaldehyde in an amount sufficient to bring the mol ratio of the melamine to total formaldehyde charged to at least 1:8, respectively.

abstracts

Relation of Film Thickness and Drying Time of Lacquers

by W. Garmsen: Fette und Seifen, vol. 57, No. 2, pp. 91-95 (1955).

From the viewpoint of physical drying, the drying time in surface and in depth through the film, coincide. The duration of the drying is proportional to the thickness of the finish coating.

From the viewpoint of drying by the absorption of oxygen by the finish film, the time of drying at the surface is accelerated and in depth, retarded. Corresponding drying formulas are given to cover this. The constants of these formulas vary under the influence of the time, the light, and the humidity. If a certain limit of coating thickness is exceeded, the drying time in depth of enamel paints drying by oxidation, increases disproportionately. The mathematical formulation of the processes of drying, permit of calculating, starting from a correct measurement of the drying time, the drying times of all other finish coating thicknesses.

Fish Oils in Organic Finishes

by C. Salvi: Pitture e Vernici (Italy) vol. 11, No. 1, pp. 37-42 (1955).

Until now for the ordinary fish oils, characterized by a disagreeable odor and a feeble drying power, a very secondary role has been reserved in the organic finish industry. Such an oil is, however, capable of being improved by appropriate treatments up to the point where it is able to be substituted without inconvenience for the classical drying oils.

Some indications are given on the preparation of the fish oils (extraction by heating of the fish in steam-heated equipment, cooling to precipitate the stearine, filtration; elimination of the excess of free acids by steam vapor entrainment; partial saponification of the oil, in a slightly alkaline medium and in the presence of catalysers, etc.). Similarly in the form of tables, the characteristics are given of four crude fish oils, and the characteristics of a treated oil. Finally, some formulas are given of mixtures of oils capable of being utilized in the manufacture of paints and varnishes.

Recent Progress in Drying Oil Technology

by J. H. Greaves: Paint Manufacture (England), vol. 25, No. 5, pp. 183-185 (1955).

Some of the most important progress realized in the domain of the drying oils was obtained by the utilization of products originating from the petroleum chemicals industry. The most interesting products technically appear to be styrene, cyclopentadiene and other non-saturated hydrocarbons.

There is then discussed the importance assumed by the derivatives of the alkyd resins as well as that of the styrenated product. The author then considers the qualities of the products obtained by reaction of the vinyltoluene on the drying oils and those of the compounds of divinylbenzene and of cyclopentadiene. Finally, recent studies are discussed concerning the modifications obtained with the drying oils by the absorption of nuclear radiations.

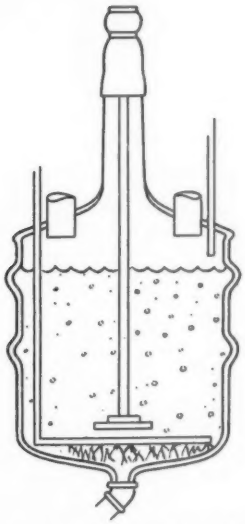
Factors Affecting the Mechanical Properties of Paint Films

by H. W. Talen: Farbe und Lack, vol. 60, No. 9, pp. 384-390.

The protective value of a paint film is, above all, conditioned by the mechanical properties which the paint

CO_2 Proves New Aid to Resin Production-Cuts Costs-Improves Quality-Saves Time

Actual Tests Prove CO_2 Cuts Oil Cooking Time 2/3!



Actual tests conducted in the laboratories of a major manufacturer* produced these conclusive findings:

CO_2 sparging, added to conventional mechanical agitation, cuts cooking time from 720 to 235 minutes! To achieve this remarkable saving, CO_2 functioned in 2 important ways—

1. Sparged up through the mixture, CO_2 markedly increased agitation, causing faster, more even cooking.
2. Water is "swept" away. Passing up through the mixture, the CO_2 bubbles absorbed water vapor from the product—allowing the mixture to reach the desired cooking temperature sooner.

Tests Verify Another Important Fact—CO_2, when sparged through the reaction mixture, inerts it—effectively inhibits oxidation—color stays desirably light and constant.

*Name on request

Assures Quality Esterification

CO_2 furnishes the ideal inert atmosphere for water removal during esterification reaction. Efficient water removal is of vital importance in all esterification reactions—including alkyd resins, plus all oils, fatty acid esters, rosin esters or varnish—to prevent reverse reaction.

Thinning

CO_2 in thinning tank retards oxidation, provides a fireproof "blanket."

Storage

CO_2 "blanket" in storage tank prevents "skinning."

Transfer

Under pressure from the CO_2 System, carbonic gas is the safest transfer medium for flammable fluids.

Filtration

CO_2 used to purge filters recovers the oil from the filter, substantially reduces cleaning time and frequency of cleanings.

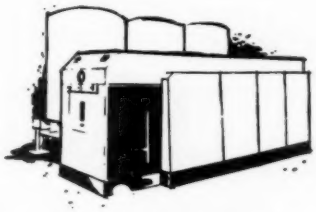
Packaging & Transport

Inerting with CO_2 prevents "skinning," eliminates costly cleanouts.

Flash Fires

As inert, heavier-than-air "blanket," CO_2 gas effectively displaces oxygen, eliminates possibility of fire or explosion.

LIQUIFLOW CO_2 SYSTEM



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FREE BULLETIN

Gives complete details on the uses above plus other important CO_2 applications in the paint and varnish industry. Send for your copy of "The Use of CO_2 in Paint, Varnish and other Alkyd-Type Resin Manufacturing."

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film possesses on application, but not less, by the variations of these properties during the active life of the film, under various influences. The object of the study was not to discuss the various methods of determination of the mechanical properties of films in general, but to show with the aid of various practical examples the important value of the dynamometer tensile tests.

Paint films of classical composition were stored under standardized conditions and submitted, after a determined time, to mechanical tests comprising strength, elasticity, elongation and rupture. The experimental paints were based on linseed oil, red lead-iron oxide, standoils-alkyd resins with white pigments, and varnish based on standoil and alkyd resins. The addition of hard resins was likewise made the object of a test.

The results are represented by strength curves. There was discussed finally, the properties of the films after extraction of the components of low molecular weight by organic solvents.

Physical and Chemical Properties Of Epoxy Compounds

Chimia Aarau: vol. 9, No. 5, pp. 104-110 (1955).

Among the new raw materials which have appeared in the finish field, the ethoxy and polyurethane resins have in recent years assumed an importance as finishing agents providing resistance to chemical products. Chlorinated rubber and polyvinyl chloride, employed up to now for this purpose, behave badly to heat since they are thermoplastic and only offer an insufficient mechanical resistance even at 80°-100° C. These are also finish filming agents drying physically which only possess a limited resistance to solvents.

There are described a series of recombinations of the ethoxy resins with the fatty acids, phenolic resins, amioplasts, amines, polyamides and isocyanates and the properties of these combinations are shown as a function of their composition. These properties depend on the reticulation reactions which take place at the ethoxy and hydroxide groups and at these two groups simultaneously; the best resistances are obtained with phenolic resins in stoving finishes. The combinations hardened with amines are not perfect; they have a good resistance to detergents but a lesser resistance to water and acids.

Properties and Application of Styrenated Alkyd Resins

by W. Geilenkirchen: Deutche Farben Zeitschrift, vol. 9, No. 5, pp. 176-182, (1955).

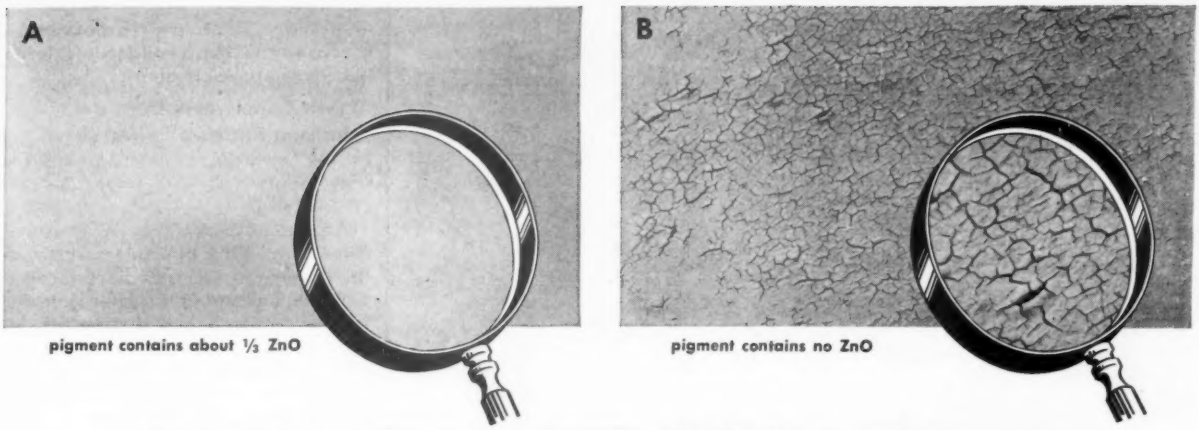
The author gives a rapid survey of the preparation of the styrenated alkyd resins and oils and describes their properties, in the light of practical tests realized under the most diverse conditions. These finish materials present as disadvantages, sensitivity to solvents and scratching and under certain conditions, give tension cracks.

Their technical advantages reside in their resistance to weathering, brilliancy, surface hardness, absence of pores, resistance to water and to chemical products and finally, their rapidity of drying. They can be recommended as primer coatings, rapid drying by stoving and in the air, as anti-rust paints, as lacquer finishes for aluminium and bronzing, for fancy ware, for the protection of machinery, tractors and agricultural machinery and for naval and ship construction. They are suitable as varnish finishes for plastic articles and this applies to polystyrol in particular. The adherence of these finishes is perfect.

Resins for Nitrocellulose Lacquers

by A. Kraus: Farbe und Lack, vol. 61, No. 4, pp. 155-158 (1955).

Details are given of tests conducted on 51 resins for nitrocellulose varnish finishes, from the viewpoint of the retention of solvents in the film and the influence of plasticizers (dibutylphthalate and dioctylphthalate). The resins tested were classified into three series which were: hard resins; urea and melamine resins; alkyd resins. This last series comprised a choice of drying resins and non-drying resins, compatible with nitrocellulose.



Are you using enough ZnO for adequate

OPACITY TO ULTRA-VIOLET LIGHT?

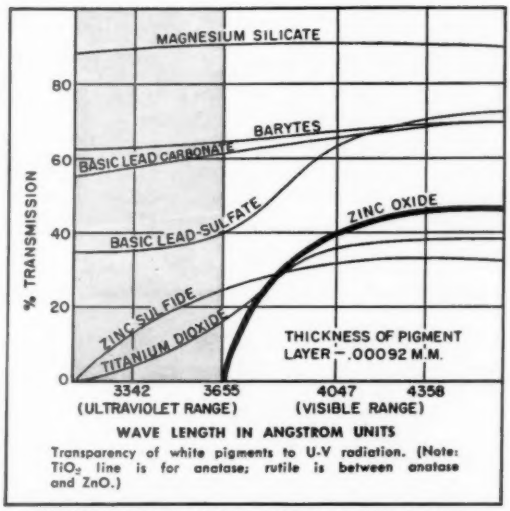
The test-panels above are coated with standard-specification exterior paints. The pigment-vehicle balance is identical in both paints. The only difference: zinc oxide constitutes about one-third of the pigment of paint A; paint B contains no zinc oxide. The two panels were simultaneously exposed to ultraviolet light in a laboratory.

The result? Paint A remains intact. Paint B has failed by cracking. The reason: zinc oxide's opacity to ultraviolet light. As the chart at right indicates, even a thin layer of zinc oxide provides total U-V absorption, outperforming all other reactive and non-reactive white pigments. ZnO is even more effective than lampblack and most colored pigments. Its presence – in sufficient quantities – ensures against destructive U-V penetration, which results in binder deterioration, bleaching, cracking.

The qualities that an adequate zinc oxide content imparts to any good paint are well known... and time-proved. But, in balancing a formulation, zinc oxide levels may be cut too far for customer satisfaction. With this in mind, consider:

Are you formulating your paints for maximum possible quality?

Are you formulating your paints with enough zinc oxide?



Transparency of white pigments to U-V radiation. (Note: TiO_2 line is for anatase; rutile is between anatase and ZnO.)

ENOUGH ZINC OXIDE GIVES YOUR PAINT...

- **OPACITY TO ULTRAVIOLET LIGHT**
- Durability
- Mildew resistance
- Tint retention
- Self-cleansing action

Technical reports are now being prepared by member laboratories of AZI on the benefits of proper zinc oxide usage. To receive copies, mail coupon.

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Paints Containing Zinc Powder

by J. F. Van Bijnsbergen: Verfkroniek, vol. 27, No. 9, pp. 237-239.

A survey is given of the composition and physical property characteristics of the paints with a high content of zinc powder, which differs from the normal zinc powder paints by their high content of zinc metal (94%-95% with 5%-6% of filming agent).

Constituted essentially of a filming agent, the zinc powder pigment and organic solvents (solvent naphtha, xylol, etc.) exercise a double protection on steels against corrosion. By the formation of a coating of zinc oxide and of zinc metal which is dense and conductive, and by a cathodic protection, the zinc being attacked first leads to the formation of a coating of oxide which in turn, protects the zinc from too great an attack. These special paints moreover, present the advantage of being able to be applied easily.

Acrylic Copolymers in Emulsion Finishes

by C. D. Wells: Paint Manufacture (England), vol. 25, No. 6, pp. 224-226, (1955).

Among the more recent polymers and co-polymers placed on the market, the co-polymerized acrylates have found a large employment in the emulsion paint finishes, on which they confer properties at least equal if not superior to those of the emulsions of styrene-butadiene or of polyvinyl acetate. However, their price, which is still high, restricts their employment for interior use and limits their application to special finishing products for leathers, textiles, etc., and similarly to paint finishes for exterior application and for use in tropical climates.

Mechanical Properties of Paint Films

by A. J. Elleman and W. D. May: J. of Oil and Color Chem. Assoc. (England), vol. 37, No. 413, pp. 595-620.

The imperfections of the normal test methods utilized for the study of the properties of the cohesion of films are discussed. Detached films are used to establish as a function of the time the extension curves under a constant load. The methods of interpretation of these curves are discussed.

A rapid graphical method which permits obtaining without difficult calculation the parameters of the logarithmic formula representative of the curves is outlined. The effects of temperature and humidity are studied.

Optical Examination of Pigments

by M. Arnold: J. of Oil and Color Chem. Assoc. (England), vol. 37, No. 411, pp. 513-518.

A large number of white pigments and bright yellows and reds were examined optically. The measurements of opacity of the white pigments give results in accordance with that which is generally admitted.

The most opaque yellow pigments are the Hansa yellows, but from the viewpoint of the market price, the most advantageous opacity is that of the chrome yellows.

Two very different types of pigments are required for the bright red paints: an inalterable pigment with great opacity whose price is not the first consideration, and a cheap pigment with great opacity whose solidity is not of the first importance. The Helio reds conform to the first conditions; corresponding to the second type of requirement, the chromium reds and the molybdenum reds, tinted by semi-organic pigments, are available.

Absorbent Properties of Coatings in Infra-Red

by J. Hovestreidt: Verfkroneik, vol. 27, No. 10, pp. 260-265.

The thermal efficiency in the treatment of paints and varnishes in the stoving furnace by infra-red radiation is essentially a function of the absorbent power of these substances for various radiations. There was thus measured, with the aid of a special equipment (measurement of the non-absorbed and reflected radiation by a spherical mirror on the Coblentz principle), the absorption factor of some surfaces—very absorbent or non-absorbent—covered with a coating of different varnishes (copal, alkyd resin, alkyd-urea resin, etc.), as a function of the wavelength.

It was possible to observe that satisfactory results were obtained for all the wavelengths (absorption power about 0.9) in the case of coatings of a thickness of at least 50 microns, under the condition that there was no dispersion of the radiation, due to the non-absorption of the radiations by the pigments. A dispersion which showed stronger wavelengths of the radiation is closer to the size of the elementary particles.

For thin paint coatings it is possible in all cases to obtain an acceptable coefficient of absorption (0.5) by utilizing a very absorbent sub-surface as for example, phosphated steel sheets.

Adherence of Paints On Aluminum

by K. Brockmann: Farbe und Lack, vol. 60, No. 10, pp. 445-448.

After a discussion of the facts which resulted in a study of the adherence of paints on aluminum, and after having clearly defined the problem to be solved, the author described the tests which were undertaken, the control of the adherence and the test results. A study of these results led to the conclusion that films of paint comprising molecular centers of hydration (hydroxyl and carboxyl groups) which show the best adherence, form measurable coatings of oxides on the surface of the aluminium stronger than those which are formed by paint films of bad adherence so that not only the adherence forces, but also chemical reactions of the appropriate filming agents, result in the adherence to the aluminum surface.

The measurement of the thickness of the coatings of oxide, increased by the paints applied, can become a sound means to evaluate the adherence on aluminum which, up to the present, has not been able to be clearly defined.

The ratio of 2.5 to 1 of the reaction coating to the atmospheric oxide coating, under the test conditions mentioned, indicates a good adherence.

Dehydrated Castor Oils

by F. Margival; Peintures-Pigments-Vernis, vol. 32, No. 3, pp. 223-224.

Although dehydrated castor oil has an iodine index which is lower than that of linseed oil, the dehydrated castor oil has a tendency to self polymerize which results in the fact that it resinifies rapidly when exposed to the air in a thin coating. The dehydrated oil can be exposed to freezing without any precipitation taking place. They can easily be thickened by cooking to obtain blown oils, standoils and "fatty" oils.

The following are the compositions of some oils of the castor types:

Acids	Percentages		
Ricinoleic	84.0	87.8	87.0
Linoleic	3.0	3.6	3.1
Oleic	10.0	7.2	7.4
Stearic	0.5	0.3	0.4
Dihydrostearic	2.5	1.1	0.6

The ricinoleic acid contains the combined water: three molecules of water for each molecule of triglyceride. The normal composition of the dehydrated oil can be thus established:

Saturated Acids	5 to 25 per 1,000
Hydroxy acids	30 to 80 "
Oleic acid	75 to 105 "
Linoleic acids	660 to 900 "
Alpha-eleostearic acid	10 to 20 "

The films obtained on exposure to air in a thin coating have the appearance of those given under the same conditions by the tung oils—they have a slight wrinkle. However it only is necessary to add cobalt driers to obtain a smooth surface film. The drying time is greatly reduced. A complete drying requires, other things being equal, 4 to 5 times less time than that for linseed oil. The hardness of the resinified oil film is however lower than that given by linseed oil; on the contrary, the elasticity is better. The dehydrated castor oil is particularly suitable for the formation of the following finishes:

(a) Lacquers for steel sheets, preventing the penetration of moisture;

(b) Lacquer paints for carriage finishing, particular for the pale shades because of the reduced tendency to yellowing;

(c) Primer coatings for wood to be covered by an enamel finish.

(d) A cover varnish for tinplate destined for food can packs, the castor oil being associated with a synthetic maleic acid resin;

(e) Enamel finish for refrigerators, linseed oil and wood oil being not so suitable because of their slight tendency to yellowing.

Several drying oils can often be associated in the finish; the type of resin to be used should be chosen carefully. The maleic resins appear to be very suitable but overcooking must be avoided. The phenol-formaldehyde resins also give good results. The same holds good for the alkyd resins on condition that suitable driers are chosen, of cobalt or lead.

Glycerine in the Varnish Industry

by G. Balbi; Pitturi e Vernici, vol. II, No. 2, pp. 99-102.

It should be remarked that apart from impurities present as such, the chemical composition of the glycerine can present fairly appreciable variations. It can include notably the polyglycerols (di- and tri- glycerols). The employment of monomeric glycerine, or practically such obtained by the modern procedures of de-ionisation, permits of manufacturing better synthetic resins under better conditions.

The author reviews the control methods for glycerine, some uncertain, which are in use and expresses the wish that one day an official standard will be developed which will provide more certain indications on this fundamental raw material to the synthetic resin industry.

Structure of Oils and Resins by Spectroscopy

by N. H. Ahlers and L. A. O'Neill, J. of Oil and Color Chem. Assoc. (England), vol. 37, No. 412, pp. 533-561.

If the sample is illuminated with successive fractions of the spectrum, it is confirmed that the infra-red spectrum is nearly always richer in bands than the ultra-violet spectrum and this is why it furnishes more experimental facts. In addition, it is more sensitive to modifications of the molecular structure and, while certain materials are completely transparent in the ultra-violet, all the organic substances present absorption in the infra-red.

The authors show how by the examination of absorption curves it is possible to identify an oil, to determine the nature of its components and eventually, its degree of oxidation. It is the same for different types of resins.

Structure of Paint Films

by S. H. Bell; Journ. Oil and Color Chemists Association, vol. 38, No. 10, pp. 595-618, (G. Britain).

The films of oils, of varnishes and of paints are not static. Modification of film properties are observed during aging.

The authors first studied drying oils and standoils. They examined subsequently the possibilities of chemical action of the pigment. The physical properties of the filming agent and those of the pigments were subsequently detailed. Finally, the consequences of aging and of weathering were considered. The work was finally terminated by a particular extended study of the films of polyvinyl acetate emulsion paints.

CALENDAR OF EVENTS

Jan. 23-25. Association of American Soap and Glycerine Producers' Convention, Waldorf-Astoria Hotel, New York.

Jan. 28-31. Plant Maintenance Show, Public Auditorium, Cleveland, Ohio.

Feb. 21-22. 11th Divisional Protective Coating Conference, Chemical Institute of Canada. Feb. 21—Seaway Hotel, Toronto; Feb. 22— Ritz Carlton Hotel, Montreal.

April 10-13. Twenty-first annual convention of the Southern Paint and Varnish Production Club, Soreno Hotel, St. Petersburg, Fla.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.

Cincinnati — Oct., Dec., Mar., May, Hotel Alms.

Dayton — Nov., Feb., April, Suttmilers.

Indianapolis — Sept., Claypool Hotel.

Columbus — Jan., June, Fort Haynes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 1st Thursday after 2nd Monday, Melrose Hotel.

Detroit, 4th Tuesday, Rachham Building.

Golden Gate, 3rd Monday, E. Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Bill Williams Restaurant.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

New England, 3rd Thursday, University Club, Boston.

New York, 1st Thursday, Brass Rail, 100 Park Ave.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Philadelphia Rifle Club.

Pittsburgh, 1st Monday, Gateway Plaza, Bldg. 2.

Rocky Mountain, 2nd Wesnesday.

St. Louis, 3rd Tuesday, Kings-Way Hotel.

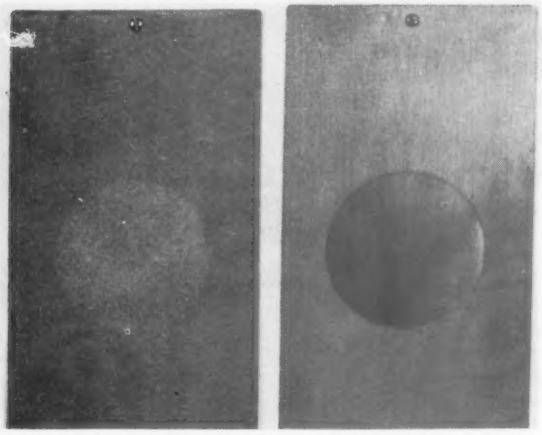
Southern, Annual Meetings Only.

Toronto, 3rd Monday, Oak Room, Union Station.

Western New York, 1st Monday 40-8 Club, Buffalo.

CHLORINATED RUBBER—*from page 39*

was easily scratched off steel panels whereas the chlorinated rubber-oil primers were already tough. Lesser amounts of chlorinated rubber would also be expected to show significant improvements in drying and toughness characteristics.



Added alkali resistance is shown by the difference in reagent spots. Left panel is coated with Parlon-linseed oil system; right with straight linseed oil.

Table VI gives starting formulations for three chlorinated rubber—linseed oil enamel topcoat formulations. A coating based on unmodified linseed oil was included to show the advantages which can be obtained by modifying oil with chlorinated rubber.

Parlon - Linseed Oil, Gray Enamels
Starting Formulations and Properties

Starting Formulations Vehicle Solids	X9555-40	X9555-42	X9555-43	Control X9555-45
65:35 Raw linseed oil: Parlon S-5	529	--	--	--
60:40 Raw linseed oil: Parlon S-10	--	537	537	--
75:25 Raw linseed oil: Z_3 linseed oil	--	--	--	471
Thinners				
Mineral spirits	384	--	--	157
25:75 Mineral spirits: turpentine	--	537	--	--
75:25 Mineral spirits: Solvesso 100	--	--	439	--
Pigments				
Rutile R-610 $T.O_2$	466	458	458	524
Lampblack	5	5	5	5
Dyphos (4% on Parlon)	7	9	9	--
Driers				
6% Cobalt (0.05% cobalt on oil)	3	2.7	2.7	4
24% Lead (0.3% lead on oil)	4.3	4	4	6
ASA antiskin agent (0.1% on oil)	0.4	0.3	0.3	0.5
	1398.7	1553.0	1455.0	1167.5
Properties				
Total solids, %	72.5	65.4	69.7	86.5
Clear vehicle solids, %	58.0	50.0	55.0	75.0
Pigment volume concentration, %	20.0	20.0	20.0	20.0
Stormer viscosity, KU	69.0	72.0	73.0	75.0
Dry for handling, hours	12 - 16	12 - 16	12 - 16	30 - 36
Dry for recoating, hours	18 - 24	18 - 24	18 - 24	--
Sward hardness, % of glass:				
24 hours	4	4	4	< 2
72 hours	6	6	6	< 2

Table VI

The dry-time and hardness data in Table VI show that linseed oil vehicles modified with 35 to 40% chlorinated rubber are suitable for use in enamel-type formulations.

Additional tests are now in progress to evaluate the other advantages obtainable by modifying oil-type vehicles with chlorinated rubber.

EMULSION PAINTS

(*From page 42*)

paint over them shortly after the water has left the film. They can be painted over all types of surfaces, including "hot plaster". Their most serious drawback is that other emulsion paints cannot be applied over them until they have had at least overnight drying.

Interior Top Coats: For interior top coats, styrene-butadiene emulsions are still the most satisfactory. They lend themselves very easily to formulations covering a wide variety of raw material costs and qualities, which are in most respects satisfactory for interior top coats. They can be modified with alkyd resins, varnishes and other film forming resins, without materially affecting the performance of the paint. They have excellent water resistance and by far the best stain removal of any of the emulsions checked. There has never been any sign of flocculation or pigment agglomeration in this paint system. They fit very readily the description of a satisfactory trade sales interior top coat, i. e., a finish which goes on easily, covers the surface over which it is applied and dries to a uniform appearance.

The package stability of these paints has a long, satisfactory history, particularly since the early 1950's. Prior to that time many paint manufacturers experienced difficulty with them. Now, however, through the increased knowledge and improved technology, package stability is no longer a problem. Dollar for dollar they produce the best quality interior paints.

Exterior Paints: It is the author's opinion, based on a rather long experience in emulsion paints that we have insufficient evidence and exposure data to warrant the use of emulsion paints as exterior top coats at the present state of the technology.

The chief short-comings are that these paints do not penetrate because the binders are high polymers and as such, have no penetrating properties. These synthetic emulsions were initially developed for use as flat wall paint vehicles, because of their non-penetrating properties. This special property of the synthetic emulsions makes them highly suitable in interior wall finishes. But, by the same token, makes them highly undesirable for exterior finishes since in this type of finish, it is necessary to get a certain amount of binder penetrating through to the substrata. Furthermore, it is important that the binder wet out the chalk on an erroding type surface, so that this chalk is reincorporated into the new exterior finish. Therefore, if the surface over which these paints are to be applied has been previously painted and exposed to the elements, it is hydrophobic and cannot be readily wet with water, consequently the emulsion breaks at the emulsion-chalk interface and the only adhesion of the paint to the substrata is its adhesion to the chalk. As the paint film tightens, during its life outdoors, it will pull and contract, causing the film to peel from the surface since the only bond that the paint has is to the chalky surface which has no bond to the substrata.

In certain specific areas and under certain ideal conditions, emulsion paints have proven reasonably satisfactory on exterior work. These areas are California, where most homes are masonry construction and are sand blasted prior to painting, also on new masonry surfaces which have not been previously painted with any other type paint.

The economics of the situation should be apparent to the paint manufacturer, since only about 1% of the homes in the United States are new masonry surfaced.

To reiterate, the present emulsion paint technology has not progressed far enough along for the paint industry to jump into exterior emulsion paints in any considerable volume.

In conclusion, it should be said that paint manufacturers, contemplating the manufacture of emulsion paints, should take into consideration the several factors discussed in this paper and take cognizance of the fact that the improving technology in water dispersed paints will continue and some day we may find that this type of paint system will far exceed present usage.

NEWS

Annual Paint Meetings Set

The 1957 annual conventions for the Federation of Paint and Varnish Production Clubs and the National Paint, Varnish and Lacquer Association will be held in October and November.

FPVPC will meet October 30 to November 2 at the Bellevue-Stratford Hotel, Philadelphia.

NPVLA will hold its meeting November 4 through 6 at the Sheraton-Park and Shoreham hotels in Washington, D.C.

•

Cuno Awards Franchises

Cuno Engineering Corp., Meriden, Conn., has announced the appointment of two new sales representatives for the Ohio and Indiana areas. They are the E. C. George Co., Dayton, and the John R. Carlson Co., Indianapolis.

The E. C. George Co. will distribute Cuno industrial filters in the Dayton, Columbus and Springfield, Ohio area.

Mr. Carlson, who will handle Cuno filters in Indianapolis, has previous experience at Cuno headquarters and in filter sales in the Cincinnati area.

•

Washburn Names Two

The T. F. Washburn Co. reports that it has chosen the B. E. Dougherty Co. as its West Coast representative to handle sales of Burnok thixotropic vehicles. B. E. Dougherty has offices in Los Angeles, Calif., and in San Francisco.

For sales in the Chicago area, the Donald R. Fitzgerald Co., Chicago, has at the same time been named agent. The Fitzgerald Co. will be responsible for T. F. Washburn's paint and printing ink vehicle sales in Chicago, part of Northern Illinois and Northern Indiana.

•

Pennsalt Units Consolidate

The Pennsylvania Salt Manufacturing Co. has completed the consolidation of its Sharples operations with the activities of the Industrial Chemicals Division, President William P. Drake announced. The new unit, known as the Industrial Division, will be directed by Hugh Land and is expected to result in more effective utilization of personnel and facilities.

Included in the fully integrated operations of the new division are plants at Natrona, Pa., Wyandotte and Riverview, Mich., Calvert City and Marion, Ky., and Houston, Texas. These units produce a variety of organic and inorganic chemicals for industrial use.

Mr. Land, who will head the new Industrial Division as General Manager, is by education and training a chemical engineer. Prior to his recent appointment, he was General Manager of the Industrial Chemicals Division.

•

New Nopco Division

The Nopco Chemical Co., Harrison, N. J., has announced the formation of a new Protective Coatings Division. This new division will be responsible for the development and sales of new and established products, in Nopco's line of processing chemicals, to the paint, latex, rubber and adhesives industries.

Formerly a part of Nopco's Specialties Sales Division, the new organization, under Assistant Division Manager, Al Silvain, was made a separate entity in order to facilitate service to Nopco customers.

•

FPVPC Invites Papers

The Federation of Paint and Varnish Production Clubs invites the technical men and women of the paint and varnish manufacturing industry to prepare and submit individual papers of technical worth for presentation at its next convention. Through the presentation of such papers, the Federation hopes to enable the technical people of paint and varnish production to gain well earned recognition.

The invitation is limited to those actively connected with the coatings manufacturing industry and does not presently include raw material suppliers. Further details on the particulars involved will be published in the near future.

TECHNICAL Bulletins

SILICONE PRODUCTS

The new 1957 reference guide to Dow Corning Silicones is now available. In it almost 150 commercially marketed silicone products are described, including several which were developed within the last year.

As in previous annual issues, products are grouped by usage (water-repellents, dielectrics, release agents, etc.), enabling engineers to locate a material by what it does.

Descriptions are brief and factual, with emphasis on charts, tables and graphs directly comparing various silicones with the materials they are displacing. Booklet is heavily illustrated throughout its 12 pages, with numerous application photographs. Dow Corning Corp., Dept. PVP, Midland, Mich.

STATIONARY DRUM ROTATOR

A new ½ H.P. stationary drum rotator is described in literature issued by the Morse Manufacturing Co., Inc., Dept. PVP, 727 W. Manlius St., East Syracuse, N. Y.

The two-page bulletin, No. 1156, gives illustrations and full specifications for the variable speed rotator, which it describes as a cost saver in agitating, blending and tumbling.

A portable drum truck by the same manufacturer is also given a fully descriptive treatment.

STORAGE OF PVA EMULSIONS

A new four-page technical bulletin, "Bulk Storage of Polyvinyl Acetate Emulsions," describes methods of shipment, storage tanks, piping and valves, pumps and installation costs. A schematic view of a bulk storage plant is included.

Copy of this bulletin, PVB No. 522, will be furnished, upon receipt of request, by Colton Chemical Co., Dept. PVP, Division of Air Reduction Co., Inc., 1747 Chester Ave., Cleveland 14, Ohio.

METAL POWDERS

Metal Disintegrating Company, Inc., Dept. PVP, Elizabeth, N. J., has issued a new eight-page bulletin giving specifications, properties and end uses of its metal powders.

Literature is prepared as a loose-leaf binder supplement. It is identified as Bulletin No. 561.

PAINT PROCESSING CHEMICALS

The complete line of Nopco Chemical Co. processing chemicals for the paint industry is described in a newly issued booklet.

The booklet gives a descriptive listing of Nopco's anti-foaming agents, pigment dispering agents, freeze-thaw stabilizers, thickeners, viscosity stabilizers, surface active agents and stearates.

Available from company by addressing Nopco Chemical Co., Dept. PVP, Harrison, N. J.

INDUSTRIAL CHEMICALS

Aceto Chemical Co., Inc., Dept. PVP, 40-40 Lawrence St., Flushing 54, N. Y., announces the availability of a new four-page products bulletin.

Over 200 fine chemicals, intermediates, and industrial chemicals are listed, including chemicals for paints and plastics. The products are listed both by industry and by chemical group to facilitate easy reading.

DEGRADATION OF OIL FILMS

The chemical mechanism of the decomposition of drying linseed oil films exposed to ultraviolet light has been identified in Navy research and is described in a technical report just released for industry use.

The report, PB 121330, "Mechanism of Linseed Oil Film Degradation Under Ultraviolet Irradiation," consists of 15 pages. It may be ordered for 50 cents from the Office of Technical Services, U. S. Department of Commerce, Dept. PVP, Washington 25, D.C.

CHEMICALS

A new eight-page brochure giving complete specifications, uses and physical properties of plasticizers, sebacates, fumarates, adipates and phthalates may be obtained from the Hatco Chemical Co., Dept. PVP, King George Post Rd., Fords, N. J.

STATISTICAL QUALITY CONTROL

Statistical quality control is the subject of a new booklet produced by Marchant Calculators, Inc., Dept. PVP, Oakland 8, Calif. Material is said to be based on Marchant's actual statistical quality control experience.

Throughout the 70 pages of the publication, there is a wide scope of topics, ranging from history of quality control through control charts, sampling plans, and technical statistical techniques. Heavy illustration by charts and graphs is prevalent throughout.

LIFT TRUCKS

"How To Operate A Lift Truck," an informative 24-page, two-color booklet, is offered by Hyster Co., Dept. PVP, 2902 N.E. Clackamas St., Portland 8, Ore. Prepared for use as part of an operator training program, it is slanted for both the beginner and the experienced operator.

A cartoon technique used in the booklet designs it for easy reading, within which is packed information about the operation of lift trucks, preventative maintenance, safety and basic materials handling. Drawings for setting up an obstacle training course are also included.

ALKALIZING CHEMICALS

A comprehensive 56-page book containing detailed information on the entire line of Solvay alkalies and chemicals has been published.

This "Products Book," as it is called, includes informative data on the uses, markets, physical and chemical properties, packaging and handling and storage of the Solvay line. Also included is a listing which groups the products by consuming industries or manufacturing processes.

The new book is illustrated with photographs of buildings and manufacturing operations at the various Solvay plants. The Solvay Process Division, Allied Chemical & Dye Corp., Dept. PVP, 61 Broadway, New York 6, N. Y.

PAINT TESTING

Crippen & Erlich Laboratories, Baltimore, Md., a subsidiary of Foster D. Snell, Inc., has announced the availability of their newly revised price schedule for various paint tests.

Copies may be obtained by writing to Foster D. Snell, Inc., Dept. PVP, 29 West 15 St., New York 11, N. Y.

1956 ASTM SUPPLEMENTS

The 1956 Supplements to a 1955 Book of Standards by the American Society For Testing Materials have just been published. Part Four of this series pertains to paint and naval stores, among other products. These standards include those for white pigments; drying oils, paint driers, and thinners; shellac, varnish, and resinous materials; lacquer and lacquer materials; bituminous emulsions; etc.

Supplement No. 4 may be purchased for $4 from the American Society For Testing Materials, Dept. PVP, 1916 Race St., Philadelphia 3, Pa.

CORRECTION

On page 73 of the December 1956 issue of Paint and Varnish Production in the item entitled "Glidden" the 10th line of the second paragraph read—"Glidden-owned McCloskey Varnish Company."

According to the McCloskey Varnish Co., Glidden is not affiliated with McCloskey Varnish Company in any way, except that Glidden operates as a warehouse for McCloskey Varnish Company in the Chicago area.

ADVERTISERS' INDEX

New Organosol Compound Used For Metal Surfaces

A versatile organosol formulation, based on Pliovic AO vinyl dispersion resin, has been developed for use in decorative and protective coating applications on metal surfaces, according to A. E. Polson, manager, Plastics Department, Goodyear Tire and Rubber Co. Chemical Division.

Formulated with 35 parts of plasticizer per 100 parts of resin, the new coating is suitable for use in a variety of industrial and commercial applications. Incorporation of chemically stable pigments permits coatings which are decorative as well as protective.

The new formulation provides flow characteristics specifically designed for metal applications and has excellent viscosity and dispersion stability. The coating may be brushed on or spray-applied.

For spray applications, simple dilution with a mixture of mineral spirits and di-isobutyl ketone is recommended. The Pliovic AO formulation also may be adjusted for other application techniques.

Versatility provided in the coating formulation enables the user to take full advantage of the coating's low plasticizer content to produce a harder coating with less tack and greater chemical resistance than is possible with comparable formulations with higher plasticization.

Because of the inert nature of the vinyl resin, the coating is resistant to many acids, bases and metallic salts. This vinyl based coating also provides excellent protection against moisture and corrosive fumes.

An adhesive plastisol primer is recommended for use with the coating to assure maximum adhesion to metal surfaces.

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Louis Gillespie Dies

Louis Gillespie, 50, president of the Gillespie-Rogers-Pyatt Co., Inc., New York City, importers of shellac, resins and mica, died December 1 following a short illness.

Mr. Gillespie was a past president of the New York Paint, Varnish and Lacquer Assn. and the U. S. Shellac Importers Assn., and a past vice president of the American Bleached Shellac Assn.

C. G. Stupp Leaves Barrett

The retirement of C. G. Stupp as Vice President, effective December 31, 1956, has been announced by T. J. Kinsella, President of Barrett Division, Allied Chemical & Dye Corp.

Mr. Stupp started with Barrett 40 years ago as a research chemist in the Edgewater, N. J., plant. Since that time he has held positions of increasing responsibility in sales, manufacturing, and research.

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Lawrence Flett Honored

Lawrence H. Flett, formerly Director, New Products and now Consultant to National Aniline Division, Allied Chemical & Dye Corp., was made an honorary member of Societe de Chimie Industrielle, during a banquet which closed the 29th Congress of Industrial Chemistry in Paris.

The Societe de Chimie Industrielle is the leading society of chemists and chemical engineers representing the chemical industry in France. Mr. Flett, President of the American Section of the Societe, has been active in affairs of the group for many years.

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CYMEL Resin 243-3—cut completely in petroleum aromatic solvents, it contains no butanol, offers very mild odor. Has even wider compatibility with short, medium and long oil alkyds, polymerized oils and many oleoresinous varnishes. Ideal for alkyd-amino formulations applied by roller, dip or spray, and as thermosetting fortifier for oils and varnishes.

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